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SOUTH AFRICAN PERISPORIALES.

I. Perisporiaceae.

By Ethel M. Doidge, D.Sc., F.L.S., Mycologist, Union Department of Agriculture.

(With Plates LVII—LXVI.)

(Read September 15, 1915.)

The Perisporiaceae and allied fungi are very plentiful in South Africa, especially in forest regions and in warm districts with a fairly plentiful rainfall. The specimens in the Union Mycological Herbarium are mostly from the Woodbush forests in the Zoutpansberg, from the Knysna, and from the coast regions of Natal; there is also a fair sprinkling from other parts of the coast and from Natal as far inland as Pietermaritzburg. The Middle and High Veld of the Transvaal are only represented by a single specimen, a species of *Dimeriella* collected at Bandolier Kop.

All that is known of the South African Perisporiales up to the present is comprised in diagnoses and descriptions of fungi collected by Professor MacOwan and Dr. J. Medley Wood, and published for the most part by Kalchbrenner and Cooke in *Grevillea*, 1880–1882, and in a few descriptions of fungi more recently collected and published in the *Annales Mycologici* and elsewhere. All the earlier work was done in the Grahamstown district and the coast region of Natal, so that a large part of the Union was left totally unexplored so far as this group was concerned.

In working through the material in the herbarium, a number of new species have come to light. It seems advisable, therefore, to publish a list of the species at present known without attempting to make the collection more complete.

Through the courtesy of Dr. Schönland and of Dr. Peringuey, of the South African Museum, I have been able to examine all of Professor MacOwan's fungi which are in their possession. Dr. Medley Wood has donated his private collection to Mr. Pole Evans, and it is deposited in the Union Mycological Herbarium. He has also kindly loaned me the sheets of Perisporiales in the Natal Herbarium collection. I have thus had access to nearly all the type specimens of the fungi described by Kalchbrenner and Cooke.

Many of these have been described only in general terms, and in some cases wrongly diagnosed, and this has caused considerable confusion. Those species which have been adequately described have been published in periodicals not readily accessible. I have therefore given in full the descriptions of known species as well as of new ones.

I am indebted to Miss S. M. Stent for the determination of the greater part of the host plants, and to Dr. J. Medley Wood, Professor J. W. Bews, and Miss M. Franks (Mrs. Howard Flanders) for the identification of a number of plants collected in Natal. I should also like to express my indebtedness to Miss A. Pegler and others who have contributed a number of interesting specimens.

A series of permanent microscopic preparations has been made of all the fungi examined, and is kept for reference in the Union Botanical Laboratory, Pretoria, where it may be seen by anyone who is interested in this group of fungi. The method adopted in preparing the slides is a modification of that used by Gaillard, the procedure being as follows: The fungus colony on the leaf surface is covered with a drop of collodion made according to the following formula:

Soluble guncotton	4 parts.
Absolute alcohol	10 „
Ether	32 „
Castor oil	2 „
Lactic acid	2 „

This formula, which is the one used by Gaillard, was found to form a collodion rather too thick for most purposes, and can be made more fluid by diluting by one-third to one-half with a mixture of—

Alcohol absolute	10 parts.
Ether	32 „

The drop of collodion is allowed to dry on the leaf, and the pellicle thus formed is then carefully detached and placed on a glass slide. The fungus colony adheres to the collodion, and can thus be placed on the slide in the exact position which it occupied on the leaf. The collodion is now redissolved by means of the mixture of alcohol and ether mentioned above, and the preparation may be dehydrated and mounted in Canada balsam.

In the enumeration of species which follows, unless otherwise stated, the numbers in brackets refer to the numbers in the Union Mycological Herbarium, which have been quoted by Sydow as I. B. Pole Evans' numbers. Among the specimens in the herbarium by far the greater number belong to the genus *Meliola*, of which over thirty species are described; and in the grouping of the species of this genus Gaillard's classification is followed, which is based on the septation of the spores and the presence and form of mycelial and perithecial setae.

All drawings have been made with the aid of the *camera lucida*, and are

on the same scale. Perithecia were drawn with Zeiss objective D and No. 2 ocular; mycelium and spores with the same objective and a No. 5 ocular; and all appendages of mycelium and perithecia with a No. 4 ocular.

The colour of the mycelium, etc., is recorded as seen by transmitted light under the microscope, and the references are to Ridgway's "Colour Standards and Nomenclature."

Perisporiaceae.

Mycelium superficial, usually conspicuous and covering the substratum with a dark growth; rarely absent and rarely forming a stroma. Perithecia formed on the mycelial hyphae or rarely on a stroma, black, more or less globose, astomous, asci numerous, usually aparaphysate. Spores very various. In some genera several forms of conidia are produced as well as ascospores, and some, *e. g. Capnodium*, are very rich in the number of their conidial forms, and comparatively rarely produce perithecia.

In a number of genera the hyphae of the perithecigerous mycelium bear small lateral processes, known as hyphopodia. These are very various in form, and are usually 1–2-celled.

The Perisporiaceae chiefly occur on living leaves and young parts of plants; several genera, however, are found on decaying vegetable matter.

Key to Genera.

A. Spores 2-celled.
  a. Aerial mycelium conspicuous.
    1. Perithecia containing a single ascus. — *Balladyna.*
    2. „ „ numerous asci.
      o. Spores hyaline.
        x. Perithecia smooth. — *Dimerosporium.*
        xx. Perithecia setulose. — *Dimeriella.*
      oo. Spores fuscous.
        x. Perithecia smooth. — *Dimerium.*
        xx. Perithecia setulose. — *Phaeodimeriella.*
  b. Aerial mycelium none or poorly developed. — *Parodiella.*

B. Spores 3- or more celled.
  a. Spores transversely septate.
    1. Spores hyaline. — *Zukalia.*
    2. Spores brown. — *Meliola.*
  b. Spores muriform. — *Capnodium.*

Balladyna.

Mycelium fuscous, septate; hyphopodia continuous or septate; mycelial setae long, rigid. Perithecia ovate-globose, black, stipitate, mono-ascate. Asci globose, 8-spored. Spores brown, smooth, one-septate.

Balladyna velutina (B. & C.) v. Höhn.

Annales Mycologici, vol. x (1912), p. 16.

(*Asterina phaeostroma* (Cke.), Grevillea, vol. x (1882), p. 130.)

(*Asterella phaeostroma* (Cke.), Sacc. Syll. Fung. ix, p. 396.)

Amphigenous, forming thin, effuse black colonies, frequently confluent. Hyphae radiating, branched, light-brown, 6–7 μ thick, frequently septate, bearing numerous hyphopodia. Hyphopodia unilateral or alternate, unicellular, sub-globose with truncated angles, or narrow ovate. Mycelial setae numerous around the perithecia, simple, more or less flexuous or curved, black, opaque, about 100 × 5–6 μ. Perithecia numerous, small, membranaceous, sub-pellucid when immature, smooth, 65–70 μ diam. Asci one in each perithecium, aparaphysate, globose, 35–40 × 25–30 μ, 8-spored. Spores conglobate, fuscous, 2-celled, cells subequal, slightly constricted at the septum, 21–22 × 9–11 μ.

On leaves of *Pavetta natalensis*, Inanda, Natal, September, 1881, J. Medley Wood (Wood No. 656).

On leaves of *Pavetta obovata* and *P. Bowkeri*, Isipingo, Natal, 13/5/13, E. M. Doidge (6627 and 6634).

On leaves of *Pavetta* sp., Kentani, 15/3/15, A. Pegler (8895), (Pegler No. 2305); Woodbush, Zoutpansberg Dist., 4/8/11, E. M. Doidge (1768).

On leaves of *Tricalysia lanceolata*, Stella Bush, near Durban, 2/7/12, E. M. Doidge (2523).

On leaves of *Tricalysia floribunda*, Umgeni, near Durban, 27/5/15, E. M. Doidge (8981).

Dimerosporium

Mycelium well developed, black, usually sub-crustaceous. Perithecia superficial, depressed-globose, sub-membranaceous, carbonaceous. Asci clavate to ovate, 8-spored. Spores 2-celled, hyaline.

Dimerosporium Osyridis Wint.

Sacc. Syll. Fung. ix, p. 401.

Winter, Flora, 1884, p. 7.

Mycelial hyphae fuscous, branched, radiating, forming black, round, irregular spots up to 2 mm. diam. Perithecia in groups, depressed-globose, rugulose, glabrous, black; under the microscope almost pellucid, fuscous, 150–210 μ diam. Asci cylindrical-clavate, very briefly stipitate, 8-spored, 42–52 × 10–12 μ. Spores obliquely distichous, oblong, 2-celled, hyaline, 9–12 × 4–5 μ, constricted at the septum. Paraphyses filiform, equalling the asci.

On living leaves of *Osyris compressa*, Cape of Good Hope, MacOwan.

I have not seen this specimen. The above, therefore, is simply a translation of the original description.

Dimerosporium Acokantherae P. Henn.

Sydow has determined Wood's Nos. 6450 and 6461 as *D. Acokantherae* P. Henn.; the fungus on the leaves of *Acokanthera spectabilis* under these numbers is not a *Dimerosporium*, it has the shield-shaped perithecia of the *Microthyriaceae*. The spores are immature.

Species Excludendae.

Dimerosporium MacOwanianum Thuem. = *Dimerium MacOwanianum* (Thuem.).
Dimerosporium Psilostomatis Thuem. = *Dimerium Psilostomatis* (Thuem).
Dimerosporium verrucicolum Wint. = *Asterodothis solaris* (Wint.) Theiss.

DIMERIELLA.

Mycelium poorly developed. Perithecia sub-globose, astomous, setulose. Asci 8-spored. Spores 2-celled hyaline.

Dimeriella annulata, Syd.
Ann. Myc. x (1912), p. 36.

Mycelium amphigenous, very slender and slightly developed, but distinctly developed in concentric rings and forming spots ¾–1 cm. diam. Hyphae slender, not much branched, light brown, and bearing sarciniform conidia. Conidia transversely 3-septate and longitudinally 1-septate, light brown. 12–17 × 7–10 μ. Perithecia superficial, globose, astomous, black, under microscope fuliginous, 50–100 μ diam., bearing a few rigid black-brown setae, 50–120 μ long and 4 μ thick. Asci sub-globose or ovate 25–30 × 20–25 μ, 8-spored. Spores ellipsoid, rounded at both ends, 1-septate and constricted, at first hyaline then brown, 17–24 × 8–12 μ, the loculi slightly unequal.

On leaves of *Gymnosporia* sp., Bandolier Kop, Zoutpansberg Dist., 11/8/11, E. M. Doidge (1832).

Dimeriella claviseta Doidge n. sp.

Epiphyllous, forming thin, spreading spots of varying size; mycelium much-branched, fuscous, formed of radiating flexuose hyphae 3–3·5 μ thick. Perithecia superficial, scattered or sub-gregarious, sub-hemispherical, black, carbonaceous, with a false ostiole, 90–115 μ diam., bearing near the base 9–15 setae. Setae club-shaped, 15–55 μ long, 3·5–7 μ thick at the base, septate and often constricted at septa, becoming broader above; apex truncated and variously lobed, frequently 2-lobed, lobes also truncated. Asci numerous, paraphysate, 8-spored, sessile, clavate-cylindrical, rounded and not thickened at the apex, 40–50 × 18–20 μ. Paraphyses simple, filiform, longer than the asci. Spores conglobate or distichous, hyaline, 1-septate,

slightly constricted, somewhat acute at the ends, oblong-ellipsoid, one cell slightly broader than the other, bi-guttulate when immature, 15–18 × 5–7 μ.

On leaves of *Vernonia angulifolia*, Winkle Spruit, Natal, 6/7/11, E. M. Doidge (2511); Winkle Spruit, 20/5/15, E. M. Doidge (9011).

Dimerium.

Mycelium abundant (less so in species parasitic on other Perisporiales), black, sub-crustaceous. Perithecia superficial, globose or ovate. Asci 8-spored. Spores 2-celled, fuscous.

Key to Species.

A. Spores small, 7–11 × 3–4 μ. — *D. intermedium.*
B. Spores 15–25 μ long.
  a. Spores 6–9 μ broad. — *D. Psilostomatis.*
  b. Spores 10–13 μ broad.
    1. Spores rounded at both ends. — *D. Gymnosporiae.*
    2. Spores somewhat acute at each end. — *D. MacOwanianum.*

Dimerium intermedium Syd.

Ann. Myc. x (1912), p. 37.

Epiphyllous, parasitic on the mycelium of a *Meliola*. Hyphae very poorly developed. Perithecia in groups, ovate or globose, black, narrowed above into a papillum which terminates in a pore, 90–150 μ diam. Asci fasciculate, numerous, clavate-cylindrical, 32–38 × 8–10 μ, sessile, 8-spored. Ascospores distichous, sub-fusiform, 1-septate, not constricted or slightly so, at first hyaline, then yellow-brown, 7–10 × 3–3·5 μ, the upper loculus broader. Paraphyses slightly longer than the asci, filiform, numerous. Pycnidia similar to the perithecia but smaller, spores elliptical, one-celled, hyaline 2-guttulate 5·5–8 × 3–4 μ.

Parasitic on *Meliola* sp. on leaves of *Isoglossa Woodii*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1578).

On *Meliola Rhois* on *Harpophyllum caffrum*, Kentani, 17/2/15, A. Pegler (8851). The spores are slightly larger in this specimen, averaging 11 × 4 μ

Dimerium MacOwanianum (Thuem.) Doidge.

(*Dimerosporium MacOwanianum* (Thuem.), Sacc. Syll. Fung. i, p. 53.)

Colonies epiphyllous, numerous, often confluent, black, radiating from the centre. Hyphae very sinuous, branched, anastomosing, warm sepia (R. XXIX.) 9–10 μ thick with fairly numerous alternate or unilateral hyphopodia, which are unicellular, globose, about 10–11 μ diam. Perithecia black, carbonaceous, large, up to 120 μ diam. Asci almost pyriform, 8-spored, hyaline, with a thin wall, 75 × 50 μ. Spores clavate, bilocular,

strongly constricted at the septum, upper part 10·5 μ thick, lower part 13 μ thick, the whole spore 25 μ ong, somewhat acuteat each end, fuscous.

On leaves of *Celastrus buxifolius*, Somerset East, July, 1876, P. MacOwan (MacOwan 1250).

Dimerium Psilostomatis (Thuem.) Sacc.

Sacc. Syll. Fung. xvii, p. 537.

(*Dimerosporium Psilostomatis*, Sacc. Syll. Fung. i, p. 54.)

Hypophyllous, rarely epiphyllous, forming effuse, black, very thin, more or less orbicular spots. Hyphae slender, branching obscurely septate, buffy olive (R. XXX) 4–5 μ thick, with fairly umerous unicellular, alternate or unilateral, ovate hyphopodia about 7 × 3·5 μ. Perithecia small, sub-globose, carbonaceous, 80–85 μ diam., surrounded by numerous radiating hyphae darker in colour than the ordinary hyphae and without hyphopodia. Asci broadly clavate, wall thickened at the apex, narrowed at the base, often slightly curved, 45 × 24–26 μ, 8-spored. Spores in three rows, narrow elliptical, 1-septate, constricted at the septum with equal loculi, rounded at both ends, 16–20 × 6–9 μ, fuscous. Paraphyses none.

On leaves of *Plectronia ciliata*, Somerset East, December, 1876, P. MacOwan (MacOwan 1291).

On leaves of *Plectronia Guenzii*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1744); Claridge, Natal, 31/5/15, E. M. Doidge (8991).

Dimerium Gymnosporiae (P. Henn.) Syd.

Syd. Ann. Myc. vii (1909), p. 546.

(*Dimerosporium Gymnosporiae* (P. Henn). Sacc. Syll. Fung. xvi, p. 408.)

Mycelium epiphyllous or amphigenous, sub-crustaceous, radiating, effuse, black. Hyphae branched, septate, sinuous, with a few small unicellular hyphopodia, 7–11 μ thick. Perithecia gregarious, membranaceous-subcarbonaceous, globulose, rugulose, about 90–110 μ diam.; asci ovoid, rounded at the apex, subtunicated, attenuated at the base, sometimes substipitate 35–50 × 30–45 μ, 8-spored, paraphysate. Spores conglobate, ovoid 1-septate, constricted, fuscous, 18–24 × 10–13 μ.

On leaves of *Gymnosporia* sp. Umbelusi, Portuguese East Africa. C. W. Howard (523).

PHAEODIMERIELLA.

Mycelium well developed, black, effuse. Perithecia globose, setulose. Asci 8-spored. Spores 2-celled, fuscous.

Phaeodimeriella capensis Doidge n. sp.

Hypophyllous or amphigenous, forming effuse, radiating, carbonaceous colonies 3–5 mm. diam. Hyphae radiating, 6–7 μ thick, with unicellular sub-opposite or alternate hyphopodia 8–12 × 6–7 μ, and opposite branches.

Perithecia numerous, black, globulose, carbonaceous, minutely verrucose, 140–160 μ diam., setulose. Setae 15–25, uncinate, about 55-65 μ long and 5 μ thick at the base, somewhat attenuated towards the blunt apex. Asci numerous, paraphysate, elliptical, 8-spored, thickened at the apex, sessile, 55–70 × 12–14 μ. Spores sub-distichous, fuscous, 1-septate, ellipsoid, very slightly constricted at the septum ; one cell slightly broader than the other, 16–18 × 4 x 5 μ ; loculi bi-guttulate. Pycnidia similar to perithecia, conidia ellipsoid, fuscous, unicellular, 2-guttulate, about 14 × 3 μ.

On leaves of *Apodytes dimidiata*, Knysna, C.P., 3/6/12. P. J. Pienaar (2426).

Parodiella.

Aerial mycelium none. Perithecia superficial, globose, astomous, black, adnate at the base to the leaf. Asci cylindraceo-clavate, 8-spored, typically paraphysate. Spores 2-celled, obscurely fuligineous.

Key to Species.

A. Spores 8–11 × 4–5 μ.	*P. Schimperi.*
B. Spores 26–30 μ long.	
a. Spores 6–7·5 μ broad.	*P. congregata.*
b. „ 10–11 μ „	*P. perisporioides.*

Parodiella Schimperi P. Henn.

Sacc. Syll. Fung. xi, p. 260.

Fung. Ethiop. i, p. 119 ; Bull. Herb. Boiss. i, 1893.

Epiphyllous ; perithecia numerous, sub-hemispherical, 100–180 μ diam. ; crowded, and forming small round groups 1–5 mm. diam. Asci ovate-cylindrical, 25–33 × 18–25 μ, 4–8-spored. Spores 1–septate, hyalino-flavidulous, 8–11 × 4–5 μ.

On living leaves of *Rhynchosia* sp., near Durban, 25/5/97, J. Medley Wood (356), (Wood No. 6445) ; Durban, 15/6/15, K. Lansdell (9015).

arodiella congregata Syd.

Ann. Myc. x. (1912), p. 37.

Perithecia epiphyllous, globose, very minute, 60–100 μ diam. ; closely crowded and forming small round groups 1–4 mm. diam., resembling in habit a *Doassansia* ; very slightly immersed at the base, astomous, wall minutely parenchymatous, under the microscope at first dark olive colour and finally more or less brown and sub-opaque. Asci varying in form and size, some ovate or sub-globose, about 30–40 × 20–30 μ, some elongated, saccate, 50–65 × 15–20 μ, sessile, thickened at the apex, 8-spored. Paraphyses indistinct. Spores distichous, tristichous or crowded together, elongated 1-septate, not constricted, olivaceous, 26–30 × 6–7·5 μ, the upper cell usually rather shorter and broader.

On leaves of *Limnanthemum Thunbergianum*, Belfast, Transvaal, 12/11/09, E. M. Doidge (765).

Parodiella perisporioides (Berk. & Curt.) Speg.
Sacc. Syll. Fung. i, p. 717.

Epiphyllous; perithecia globose, 150–200 μ diam., astomous, smooth, black, superficial, adnate at the base, very closely crowded together, entirely covering the whole of the leaf surface; wall of the perithecium membranaceous, parenchymatous, olivaceous-fuliginous. Asci clavate, briefly pedicellate, rounded and thickened at apex which is traversed by a pore, 120 × 20–24 μ, 8-spored.

Paraphyses filiform. Spores distichous, elliptic-bi-conical, 1-septate, constricted, at first each loculus is 1-guttulate, later eguttulate; the upper cell somewhat more swollen and sometimes slightly curved; obtuse at both ends, fuliginous 28–30 × 10–11 μ.

On leaves of *Eriosema* sp., Belfast, Transvaal, 16/2/09, E. M. Doidge (574).

On leaves of *Indigofera* sp., Belfast, Transvaal, 16/2/09, E. M. Doidge (576).

On leaves of *Vigna angustifolia*, Garstfontein, Pretoria Dist., 12/2/10 and 4/12/11, P. J. Pienaar (1201 and 1958); Muckleneuk, Pretoria, 27/4/13, I. B. Pole Evans (6694).

On leaves of *Psoralea decumbens*, Newlands, C.P., 20/11/10, C. P. Lounsbury (1005).

Zukalia.

Mycelium abundant, effuse; perithecia superficial, globose, sub-astomous, sub-membranaceous, black. Asci 8-spored. Spores ovate-oblong, 2-pluri-septate, hyaline or sub-hyaline.

Zukalia transvaalensis Doidge n. sp.

Epiphyllous, effuse forming very thin, spreading, black colonies. Hyphae radiating, branched, anastomosing 7–8 μ thick, composed of cells about 30–32 μ long, bearing unicellular hyphopodia. Hyphopodia unilateral, alternate or opposite, globose, flattened, or sub-lobed, usually broader than long, 8–10 × 11–14 μ. Perithecia black, globose, scattered, rather numerous, under microscope sub-pellucid, brown, smooth, with a false ostiole, 130–160 μ diam. Asci numerous, fasciculate, 8-spored, thin-walled, elliptical, or narrow-ovate, frequently slightly curved, 70–90 × 18–22 μ. Paraphyses none. Spores distichous or tristichous, clavate, hyaline, 5-septate, 45–55 × 5–7 μ, obtuse at both ends.

On leaves of *Eugenia Zeyheri*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1759).

Meliola.

Fungi living on the surface of leaves, more seldom on branches. Perithecigerous mycelium dark brown, thick, always provided with capitate hyphopodia (small 2-celled processes, which Gaillard calls abortive perithecia), and very often with mucronate hyphopodia (abortive mycelial branches), and frequently with setae (sterile, erect branches). Perithecia globose or ovoid, rarely dimidiate, carbonaceous, astomous, or with a false ostiole formed of more delicate, paler cells. Asci spherical or ovoid, rarely cylindrical or claviform, usually evanescent. Spores brown at maturity, large, transversely 2–5 septate. Conidiiferous mycelium slender, paler. Conidia fusiform, transversely septate.

Key to the Species.

I. Spores 3-septate.
  A. Setae none.
    a. Spores 40–50 μ long.
      x. Capitate hyphopodia 20–30 μ long. Spores slightly constricted. *M. manca.*
      xx. Capitate hyphopodia 18–21 μ long. Spores deeply constricted. *M. natalensis.*
      xxx. Capitate hyphopodia crowded 14–18 μ long. Spores slightly constricted. *M. conferta.*
    b. Spores 50–60 μ long.
      x. Capitate hyphopodia small, terminal cell globose. *M. Podocarpi.*
      xx. Capitate hyphopodia large, terminal cell lobed. *M. speciosa.*
  B. Setae mycelial, simple and straight.
    a. Spores 25–30 μ long. *M. torta.*
    b. Spores 45–50 μ long. *M. ganglifera.*
    c. Spores 57–68 μ long. *M. peltata.*
  C. Setae mycelial, branched. *M. cladotricha.*

II. Spores 4-septate.
  A. Setae none.
    a. Spores 45–55 μ long.
      x. Capitate hyphopodia lobed. *M. ditricha.*
      xx. Capitate hyphopodia not lobed. *M. Hendeloti.*
    b. Spores not more than 45 μ long.
      x. Superficial cells of perithecium convex, rounded.
        . Cells of hyphae 25–30 μ long. *M. glabra.*
        . . Cells of hyphae about 18 μ long. *M. Strophanthi.*

xx. Superficial cells of perithecium mammillate. *M. Peglerae.*

xxx. Certain superficial cells of perithecium sub-cylindrical, recurved. *M. inermis.*

B. Setae perithecial. *M. Bosciae.*

C. Setae mycelial, simple and straight.

a. Setae quite straight or abruptly geniculate at the base.

x. Capitate hyphopodia usually opposite.

. Spores 35–40 μ long. *M. capensis.*

. . Spores 47–55 μ long. *M. Toddaliae.*

xx. Capitate hyphopodia usually alternate.

. Spores less than 35 μ long. *M. microspora.*

. . Spores 40–50 μ long.

0 Apex of setae obtuse. *M. amphitricha.*

00 Apex of setae acute. *M. Rhois.*

. . . Spores 48–55 μ long.

0 Setae translucent. *M. microthecia.*

00 Setae opaque throughout. *M. sinuosa.*

b. Setae more or less flexuose.

x. Capitate hyphopodia alternate. *M. polytricha.*

xx. Capitate hyphopodia usually opposite. *M. rigida.*

D. Setae mycelial, curved.

a. Spores 38–48 × 16–20 μ. *M. falcata.*

b. Spores 50–55 × 14–16 μ. *M. arcuata.*

c. Spores 50–54 × 18 μ. *M. Woodiana.*

E. Setae mycelial, forked.

a. Setae only forked at the tip. *M. furcillata.*

b. Setae with more or less spreading branches.

x. Ultimate branches usually 3-fid at apex. *M. varia.*

xx. Ultimate branches usually bi-fid.

0 Main branches of setae up to 90 μ long. *M. bifida.*

00 Main branches of setae up to 130 μ long. *M. leptidea.*

Meliola manca Ell. & Mart.

Gaillard, Le Genre Meliola, p. 37.

Amphigenous, but most frequently epiphyllous, forming black, orbicular, or irregular, thinly carbonaceous spots, 2–5 mm. diam.; these are frequently confluent and cover the greater part of the leaf surface. Perithecigerous mycelium, consisting of slender, rather pale hyphae 7–8 μ diam., articulations distant, cells 18–30 μ long; branches remote and sometimes anasto-

mosing. Capitate hyphopodia alternate, distant, stipitate, 21·5–29 μ long; upper cell irregular, more or less lobed, 14·5–18 × 14·4 μ; mucronate hyphopodia not very numerous, paler, opposite, ampulliform, rather slender, suddenly narrowed near the apex into a short neck, measuring about 7 × 18 μ. Perithecia scattered or in small groups, black, globular, 150–180 μ diam., with a false ostiole formed of paler cells, verrucose; bearing on the surface a number of sub-cylindrical, larviform appendages, terminating in a recurved point, 60–110 × 20–26 μ at the base, unicellular, colour russet-brown, wall rugulose. Asci ovoid, shortly pedicellate, 4-spored. Spores 3-septate, straight or slightly curved, similar in colour to hyphae, tawny olive (R. XXIX), slightly constricted at the septa, rounded at both ends, 40–45 × 13–14 μ.

On leaves of *Rubus rigidus*, Winter's Kloof, Natal, 17/6/11, E. M. Doidge (1574); Woodbush, Zoutpansberg Dist., 5/8/11, E. M. Doidge (1771); Cramond, Natal, 3/6/12, I. B. Pole Evans (2405); Knysna, C.P., 3/6/12, P. J. Pienaar (2425).

On leaves of *Pygeum africanum*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1761).

Meliola natalensis Doidge n. sp.

Amphigenous, mostly epiphyllous, forming round, irregular, black carbonaceous spots, 2–3 mm. diam. Mycelium radiating, branched; hyphae tawny olive (R. XXIX), somewhat sinuous and frequently constricted at the septa, 6–8 μ thick, composed of cells 14–18 μ long; branches usually opposite. Capitate hyphopodia alternate or unilateral, stipitate, 18–21 μ long; basal cell short, tapering to point of junction with hypha; terminal cell broader than long, lobed usually with 2–3 lobes, which are again bilobulate, 12–14 × 16–20 μ. Mucronate hyphopodia rare, scattered, slender, straight or recurved, ca. 16–18 × 4–5 μ. Mycelial setae none. Perithecia grouped near centre of mycelium, black, globose, carbonaceous, 130–150 μ diam., rugulose, certain of the superficial cells being prolonged into sub-cylindrical vermiform processes 40–55 × 18 μ, sometimes recurved at the tip. Asci 2-spored. Spores 3-septate, cylindrical, deeply constricted at the septa, 40–44 × 14–16 μ, straight or slightly curved, cells subequal.

On leaves of shrub unknown, Umgeni, near Durban, Natal, 27/5/15, E. M. Doidge (8980).

Meliola conferta Doidge n. sp.

Amphigenous, forming dull, black, sub-crustaceous colonies 1–3 mm. diam. Hyphae tawny olive (R. XXIX), straight, with numerous opposite branches, 6–8 μ thick, composed of cells 11–18 μ long. Capitate hyphopodia very numerous, crowded together, opposite, occasionally, on the smaller branches,

unilateral or alternate, 14–18 μ long; terminal cell variously lobed, usually with 2–3 lobes, each of which is bi-lobulate, 9–14 × 11–14 μ. Mucronate hyphopodia rare, interspersed with the capitate hyphopodia, 18 μ long, pale, with a short, rather thick neck. Mycelial setae none. Perithecia (not quite mature) few, scattered, 100–130 μ diam., black, globose, verrucose, certain of the surface cells being prolonged into sub-cylindrical processes about 18 μ long. Asci not seen. Spores almost black, 3-septate, straight or slightly curved, somewhat constricted at the septa and tapering towards the rounded ends, 40–50 × 18–25 μ.

On leaves of tree unknown, near Durban, 14/5/1897, J. Medley Wood (345), (Wood 6457).

On leaves of *Doryadis rhamnoides*, near Durban, 14/5/97, J. Medley Wood (Wood 6454).

On leaves of tree undetermined, 22/7/15, Mayville, Natal, J. Medley Wood (9065).

This specimen, which is labelled *M. sapindacearum* in Medley Wood's collection, is the one referred to under that name in *Hedwigia*, 1899, p. 132, with the following note: "Hab. in foliis arboris ignotae et *Doryadis rhamnoides*, pr. Durban. Obs. Perithecia obsoleta hinc species dubia. Affinis quoque *M. triloba* Wint." The present specimen has both perithecia and spores, and differs widely from *M. sapindacearum* in the 3-septate spores and the absence of mycelial setae.

Wood's numbers are not quoted in the note in *Hedwigia*, but the numbers are given in a letter containing a list of determinations sent by Sydow to Dr. Medley Wood, now in my possession.

Meliola Podocarpi Doidge n. sp.

Amphigenous, but mostly epiphyllous, forming thin, black colonies 2–5 mm. diam.; frequently confluent. Hyphae straight or somewhat sinuous, 6–7 μ thick, sepia or warm sepia (R. XXIX), composed of cells 16–18 μ long; branches opposite. Capitate hyphopodia alternate, briefly stipitate, 14–16 μ long; terminal cell globose, 10–12 × 10–11 μ. Mucronate hyphopodia not seen. Mycelial setae none. Perithecia scattered or in small groups, black, globose, verrucose, 200–250 μ diam.; when immature there are numerous, slender hyphae radiating from the base of the perithecia, some of them bearing hyphopodia; occasionally a few of these are upright, and become differentiated into slender, pointed setae. Asci 2–4-spored. Spores 3-septate, strongly constricted at the septa, slightly curved and tapering towards the rounded ends, 50–56 × 14–16 μ; the two central cells larger than the others, and when the spore is immature, darker in colour.

On leaves of *Podocarpus Thunbergii*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1748); Knysna, C.P., P. J. Pienaar (2436).

On leaves of *P. elongata*, Fort Cunningham, Toise River, 20/3/15, Forest Officer (8897).

Meliola speciosa Doidge n. sp.

Hypophyllous, forming orbicular-irregular spots 1–5 mm. diam. Hyphae branching, occasionally anastomosing, up to 11 μ thick, Mikado brown (R. XXIX), articulations short, about 18 μ long. Capitate hyphopodia numerous, alternate, stipitate, basal cell 7–11 × 5·5–7 μ, narrower at junction with hypha; terminal wall broader than long, 18–21·5 × 21·5–25 μ, irregular, 2–4-lobed, each lobe being slightly 2-lobed; mucronate hyphopodia very scarce, paler, slender and curved, about 25 × 7 μ. Mycelial setae none. Perithecia grouped in the centre of the colony, black, with a false ostiole, almost smooth, 165–265 μ diam.; bearing a number of sub-cylindrical, larviform appendages, 70–90 μ long, 18 μ thick at the base, apex curving upward. Ascus 2-spored, evanescent. Spores ellipsoid, 3-septate, scarcely constricted at the septa, hazel brown (R. XIV), 52–61 × 21·5–25 μ. Conidiophores dark brown, erect, septate, about 150 μ long; conidia fusoid, 4-septate, pale.

On leaves of *Gymnosporia* sp., Woodbush, Zoutpansberg Dist., 2/8/11, E. M. Doidge (1740).

Meliola torta Doidge n. sp.

Amphigenous, forming thin, black colonies 5–10 μ diam. Hyphae slender, 6–7 μ thick, Vandyke brown (R. XXVIII). tortuous, anastomosing, cells 25–36 μ long; branching irregular, usually unilateral. Capitate hyphopodia, distant, slender, tortuous, alternate or unilateral, 32–40 μ long; basal cell irregular in shape and size, rather long and slender; frequently geniculate; terminal cell 14–25 × 14–20 μ, variously lobed and contorted, some flattened at apex, others more or less rounded. Mucronate hyphopodia rather numerous, 1-celled, occasionally 2-celled, unilateral, alternate, or opposite, interspersed with capitate hyphopodia, ampulliform, with a rather long, slender neck, 20–36 μ long. Mycelial setæ not numerous, scattered, simple, straight, abruptly geniculate at the base, 300–600 × 10–11 μ at base, tapering to the acute apex, opaque except near apex. Perithecia few and scattered, black, globular, rugulose, 160–250 μ diam. Asci numerous, 8-spored; spores distichous or conglobate, 3-septate, brown, scarcely constricted at septa, clavate, broader at one end than other, 25–30 × 7–11 μ (at broadest part). The two middle cells are longer than the terminal ones.

On leaves of *Trichocladus crinitus*, Izelini Forest, King William's Town Dist., 8/6/15, Forester Emmett (9064).

There is another *Meliola* associated with this on leaves with 4-septate spores and no setae—but it was badly parasitised and I was unable to etermine it.

Meliola ganglifera Kalch.

Grevillea ix, p. 34, pl. 138, fig. 49.

Gaillard, Le Genre Meliola, p. 40.

Amphigenous; colonies orbicular, often confluent, velvety black, up to 8 mm. diam. Perithecigerous mycelium at first vinaceous buff (R. XL), becoming much darker with age (auburn R. II); hyphae 7–8 μ thick, sinuous, cells fairly long, 25–28 μ. Capitate hyphopodia alternate, rather numerous, stipitate, 28–36 μ long, straight or incurved; terminal cell varied in form, usually with 3 or 4 tuberculate protuberances. Mucronate hyphopodia paler, ampulliform, gradually attenuated from the base into a fairly long neck, 18–21 × 8–9 μ; mycelial setae numerous, black, opaque, except near acute apex, bent almost at right angles just above the slightly swollen base, thick-walled, 200–360 × 8 μ, straight or more or less flexuous. Perithecia black, globose, verrucose, 150–220 μ diam. Ascus ovoid, briefly pedicellate, 2–4-spored. Spores cylindrical, 3–septate, auburn (R. II) rounded at the extremities, slightly constricted at the septa, 45–50 × 15–18 μ.

On living leaves of *Curtisia faginea* Ait. (MacOwan 1349), Woodbush, Zoutpansberg Dist., J. Burtt-Davy (134).

On leaves of host undetermined, Kentani, C.P., 7/10/14, A. Pegler (8392), (Pegler No. 1953).

Meliola peltata Doidge n. sp.

Amphigenous, forming orbicular, black pilose spots, 3–7 mm. diam., sometimes confluent. Perithecigerous mycelium forming a pseudoparenchymatous disc with a definite margin, antique brown (R. III). Composed of much branched hyphae, branching flabelliform; cells of the hyphae about 5·5–7 × 11 μ. Capitate hyphopodia alternate, closely appressed to the hyphae, sub-clavate, stipitate, 39–50 μ long; terminal cell compressed, usually tuberculate or lobulate, 28–32 μ long. Mucronate hyphopodia not seen. Mycelial setae numerous, simple, straight, 10–11 μ thick and up to 850 μ long, opaque, black, but paler nearer the acute apex. Perithecia not numerous, scattered, black, scabrous but not verrucose. Asci not seen. Spores 3-septate, occasionally 2-septate, constricted at the septa, attenuated towards each of the rounded ends, Vandyke brown (R. XXVIII) 57–68 × 25–32 μ, the majority about 60 × 29 μ.

On leaves of *Podocarpus Thunbergii*, Knysna Forest, C.P., 3/6/12, P. J. Pienaar (2436).

Meliola cladotricha Lev.

Ann. des Sc. Nat., v, 1846, p. 266.

Gaillard, Le Genre Meliola, p. 46.

Amphigenous, forming thick, black velvety spots 2–5 mm. diam., frequently confluent, with a fimbriate margin. Perithecigerous mycelium

composed of branched hyphae 6–8 μ thick with remote articulations, Isabella colour (R. XXX). Capitate hyphopodia alternate, very rare, stipitate, terminal cell pyriform. Mucronate hyphopodia opposite or unilateral, rarely unicellular, frequently developing 2–3 cells, paler than the mycelium. Mycelial setae opaque at the base, paler at the summit, bifid, each division giving rise to two or three branches with acute apices. There are frequently groups of crystals of calcium oxalate at the tips of the setae. Perithecia globose, black, 300–400 μ diam., with granular surface. Asci ovoid with a very short foot, 2-spored. Spores 3-septate constricted at the septae, attenuated towards the ends, 65–70 × 18–22 μ.

On leaves of *Eugenia Zeyheri*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1759).

Meliola ditricha (K. & Cke.) Doidge.

(*Asterina ditricha* K. & Cke., Grevillea, 1880, p. 32.)

Hypophyllous, effuse, forming thin black colonies 2–5 mm. diam. Hyphae radiating, Vandyke brown (R. XXXVII), 7–10 μ thick, composed of cells 18–21 μ long; branches usually opposite, anastomosing. Capitate hyphopodia alternate, stipitate 25–30 μ long, terminal cell irregular in shape, variously lobed 18–22 × 14–22 μ. Mucronate hyphopodia fairly numerous, on separate short branches or interspersed with the capitate hyphopodia, opposite or unilateral, slender, lower part not much thicker than the neck, 21–25 × 7–8 μ. Setae none. Perithecia not numerous, grouped in centre of colony, black, globose (not mature). Asci not seen. Spores 4-septate, nearly black, constricted at the septa, rounded at both ends 54 × 25 μ.

Conidiiferous mycelium slender, paler; conidiophores erect, 70–80 μ long, conidia fusoid, 3-septate, 15–18 × 4–8 μ.

On leaves of *Celastrus* sp., Inanda, Natal, May, 1876, Medley Wood (Wood No. 3).

Meliola Hendeloti Gaill.

Gaillard, Le Genre Meliola, p. 49.

Amphigenous, but mostly epiphyllous, forming thin, black, orbicular colonies 2–3 mm. in diam. Hyphae straight or sinuous, slightly constricted at the septa, Brussels brown (R. III), 8–10 μ thick, composed of cells 25–40 μ long. Capitate hyphopodia alternate or unilateral, 16–18 μ long, bi-cellular, terminal cell globular or compressed 11–13 × 9–11 μ. Mucronate hyphopodia fairly numerous, opposite, usually on short branches not interspersed with capitate hyphopodia, 15–18 μ long, lageniform. Mycelial setae none. Perithecia scattered, black, globose, 180–220 μ diam., superficial cells developed into mammillate processes, the top of each process being recurved or bent laterally. Asci 2-spored, subglobose, very briefly pedicellate. Spores 45–50 × 18–22 μ, laterally compressed, 4-septate, cylindrical, rounded at both ends, slightly constricted at the septa.

On leaves of *Nuxia floribunda*, 3/8/11, Woodbush, Zoutpansberg Dist., E. M. Doidge (1776).

Differs from Gaillard's description of *M. Hendeloti* only in presence of mammillate cells on perithecium; Gaillard puts this fungus in group "Perithecia smooth or simply granular," but in his description says "Perithecia rugulose."

Meliola glabra Berk. & Curt.

Gaillard, Le Genre Meliola, p. 59.

Amphigenous, but most frequently epiphyllous, forming black, crustaceous spots 2–3 mm. diam. Hyphae 7–9 μ thick, formed of cells 25–30 μ long, Dresden brown (R. XV). Capitate hyphopodia alternate or unilateral, shortly stipitate, 18–25 μ long; terminal cell ovoid, globose, or slightly lobed 11–14·5 × 11 μ. Mucronate hyphopodia ampulliform, about 14 μ long, drawn out at the tip into a short, rather thick neck, not very numerous. Mycelial setae none. Perithecia grouped to the number of 8–10 in the centre of the colony, the superficial cells forming in places conical protrusions, rounded at the top, 150–180 μ diam., with a false ostiole at the summit. Asci ovoid-oblong, 2–4-spored. Spores 4-septate, constricted at the septa, rounded at the ends, 40–45 × 16–18 μ.

On leaves of *Canthium* sp., Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1780).

This fungus differs slightly from the type described by Gaillard, the perithecia being smaller—he describes them as measuring 200–250 μ. Otherwise the description corresponds with his.

Meliola Strophanthi Doidge, n.sp.

Amphigenous, mostly hypophyllous, forming minute, black, sub-crustaceous, orbicular-irregular spots 1–2 mm. diam. Hyphae somewhat sinuous, 6–9 μ thick, composed of cells about 18 μ long, Brussels brown (R. III), branching opposite. Capitate hyphopodia alternate, briefly stipitate, 20–25 μ long; terminal cell cylindrical, straight to slightly curved, convex at the apex 16–18 × 7–9 μ. Mucronate hyphopodia not numerous, ampulliform, about 18 μ long, with a short neck. Mycelial setae none. Perithecia not numerous, in small groups, globular, black, 215–250 μ diam.; surface cells convex, rounded, conical. Mature asci not seen. Spores 40–45 × 16–18 μ, 4-septate, very slightly constricted at the septa, cylindrical, broadly rounded at the ends.

Conidiiferous mycelium interwoven with the perithecigerous hyphae, paler, hyphae thinner, with numerous dark brown erect conidiophores 180–200 μ long. Conidia fusiform, 3-septate, 18–32 × 5–9 μ.

On the leaves of *Strophanthus speciosus*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1781).

Meliola Peglerae Doidge.

Epiphyllous, sub-crustaceous, black, forming black orbicular colonies 1–3 mm. diam. which form larger spots by becoming confluent. Hyphae frequently septate, formed of cells 8–14 × 7–9 μ, colour Saccardo's umber (R. XXIX). Branches anastomosing. Capitate hyphopodia numerous, alternate, or unilateral, briefly stipitate, appressed towards the hyphae; basal cell 7 × 4–7 μ; terminal cell larger, obovoid, straight or more frequently bent backward at the tip (almost retort-shaped) 14–18 × 7–11 μ. Mucronate hyphopodia few in number, opposite, ampulliform, 14–22 × 7 μ. Mycelial setae none. Perithecia crowded together in the centre of the colony, black, 126–233 μ diam. Superficial cells mammillate. Asci 2–4-spored, evanescent, Spores oblong, rounded at both ends, 4-septate, slightly constricted at the septa, 29–43 × 16–18 μ.

On leaves of *Anastrabe integerrima*, Kentani, 4/6/12, A. Pegler (2363), (Pegler No. 1883).

On leaves of shrub unknown, Umgeni, near Durban, Natal, 16/7/15, J. Medley Wood (9036).

Meliola inermis Kalch. & Cke.

Grevillea 1880, p. 34, tab. 38, fig. 51.

Sacc. Syll. Fung. i, p. 64.

Gaillard, Le Genre Meliola, p. 64.

(*M. quinquespora* Thuem., Myc. Univ. n. 657—*M. quinqueseptata* Rehm. Ascom.)

Amphigenous, but mostly epiphyllous; forming small, black, thinly carbonaceous colonies 1–3 mm. in diam., sometimes very numerous and then confluent. Hyphae 7–8 μ thick, composed of cells 18–22 μ long, sinuous, tawny olive (R. XXIX). Capitate hyphopodia alternate, about 25 μ long. stipitate; terminal cell rounded, truncate or somewhat lobed, averaging 14–16 × 10–11 μ. Mucronate hyphopodia not so numerous, opposite, only slightly paler, 14–18 μ long, ampulliform, with a short neck. Setae none. Perithecia scattered, black, globular, 200–250 μ diam., the surface being covered with conical or horn-shaped unicellular processes, 60 × 15 μ. Asci ovoid briefly pedicellate, 2-spored. Spores 4-septate, constricted at the septa, elliptical, rounded at the extremities, similar in colour to the mycelium, 35–38 × 13–15 μ.

On leaves of *Buddleia auriculata*, Boschberg nr. Somerset East, C.P., July, 1876, MacOwan (MacOwan 1251), (de Thüm Myc. Univ. 657) Bulwer, Natal, April, 1914, W. Haygarth (7790).

On leaves of *Buddleia salvifolia*, Woodbush, Zoutpansberg, 2/8/11, E. M. Doidge (1742).

On leaves of *Buddleia pulchella*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1571).

Meliola Bosciae Doidge n. sp.

Epiphyllous, rarely hypophyllous; forming a thin, black, sub-orbicular pellicle 2–3 mm. wide on the leaf surface. Hyphae radiating, frequently anastomosing in the neighbourhood of the perithecia, tawny olive (R. XXIX), septa at times curved, vermiculate, 5·5–9 μ thick; branches opposite or unilateral. Capitate hyphopodia alternate or unilateral, rarely opposite, shortly stipitate, 14–20 μ long; terminal cell 10·5–16 μ long, scabrous, convex, truncate or slightly lobed. Mucronate hyphopodia most numerous in the neighbourhood of the perithecia, on separate branches or scattered amongst the capitate hyphopodia, opposite or unilateral 14–18 μ long and about 7 μ thick at the base, ampulliform, with a long neck which is frequently incurved. Mycelial setae none. Perithecia globose, black, verrucose, 160–180 μ diam., with 6–12 setæ scattered on the surface. Setae simple, 70–90 μ long, opaque, and about 6 μ thick at the slightly bulbous base, and tapering to the obtuse pellucid apex, straight, or abruptly bent just behind the apex. Ascus 2–3-spored, ovate, shortly pedicellate, evanescent. Spores sepia colour (R. XXIX) 4-septate, constricted at the septa, rounded at both ends, 39–47 × 10·5–14·5 μ.

On leaves of *Boscia caffra*, Winkle Spruit, Natal, 6/7/12, E. M. Doidge (2510); Stella Bush, Durban, 7/6/15, K. Lansdell (9016).

On leaves of *Maerua pedunculosa*, Umgeni, Natal, 16/7/15, J. Medley Wood (9024).

Meliola capensis (K. & Cke.) Theiss.
Ann. Mycologici x (1912), p. 19.
(*Asterina capensis* Kalch. & Cke., Grevillea ix, p. 32.)

Epiphyllous, sometimes hypophyllous, forming round black colonies about 2–4 mm. broad, often confluent. Hyphae straight, radiating, branched, up to 8 μ thick, frequently septate, colour Saccardo's umber (R. XXIX). Branches widely divaricating. Capitate hyphopodia opposite, numerous, 10·5–15 μ long, widely divaricating, regular; terminal cell 9–10 × 7–8 μ, basal cell about 3·5 × 6–7 μ. Mucronate hyphopodia opposite, numerous, 14–18 μ long. Mycelial setae straight, simple, opaque, 300–400 × 5–10 μ, pellucid near the acute apex. Perithecia gregarious, black, globose, verrucose, 100–200 μ diam. Asci 2-spored, evanescent. Spores oblong, rounded at both ends, 4-septate, slightly constricted at the septa, 35–40 × 14–16 μ.

On leaves of *Hippobromus alatus*, Inanda, Natal, J. Medley Wood (Wood No. 57); Somerset East (MacOwan No. 1328); Winkle Spruit, 6/7/12, E. M. Doidge (2499); Verulam, 3/7/13, I. B. Pole Evans (6805); Umgeni, Natal, 16/7/15, J. Medley Wood (9034).

On leaves of *Hippobromus* sp., Kentani, 7/10/14, A. Pegler (8391). (Pegler No. 1956).

Meliola Toddaliae Doidge n. sp.

Amphigenous, forming black, circular, velvety spots 2–3 mm. diam., very easily detached from the leaf. Hyphae fuscous (R. XLVI), much branched, 7–10 μ thick, composed of cells 10–18 μ long; branches usually opposite, less frequently unilateral, anastomosing, very pale near the tips. Capitate hyphopodia numerous, opposite, 18–20 μ long, stipitate; terminal cell usually sub-ovate and slightly in- or recurved, but often becoming flattened in various directions by compression, 14–16 × 8–10 μ. Mucronate hyphopodia not numerous, opposite, ampulliform, with a straight or curved neck, 18–20 × 8–10 μ. Mycelial setae numerous, simple, straight, erect, at first translucent then becoming opaque almost to the acuminate apex, more or less torulose, 300–350 × 8–10 μ. Perithecia rather numerous, scattered, hidden among the setae, black, globose, verrucose, 200–250 μ diam. Asci 3–4-spored. Spores 4-septate, slightly constricted, cylindrical, rounded at both ends, thick-walled, laterally compressed, 47–55 × 18–21 × 14 μ.

On leaves of *Toddalia lanceolata*, Kentani, 16/12/14, A. Pegler (8788), (Pegler No. 1960 A.); Henley, near Pietermaritzburg, Natal, 24/5/15, E. M. Doidge (8999).

Meliola microspora Pat. et Gaill.

Bull. Soc. Myc. 1888, p. 104.
Sacc. Syll. Supplem. Univ. i, p. 426.
Gaillard, Le Genre Meliola, p. 75.
var. *Africana* var. nov.

Amphigenous, forming very minute black colonies ½–1 mm. in diam. Hyphae slender, radiating, Isabella colour (R. XXX) 5–8 μ thick, composed of cells 20–35 μ long. Capitate hyphopodia distant, alternate or unilateral, stipitate, widening gradually from the base to just below the convex or rather pointed apex, 20–21·5 × 7–8 μ, terminal cell ovate, 14–16 μ long. Mucronate hyphopodia opposite, interspersed with the capitate hyphopodia, ampulliform, with a neck 5–7 μ long. Mycelial setae not numerous, more numerous in the neighbourhood of the perithecia, simple, somewhat abruptly geniculate near the base or incurved, 230–320 μ × 6–7 μ, very dark at the base, rather paler near the apex. Perithecia few, black, verrucose or rugulose, globular, 150–180 μ diam. Asci ovate, briefly pedicellate, 3–4 spored, Spores 4-septate, cylindrical, broadly rounded at both ends, slightly constricted at the septa, 26–32·5 × 10·5–14 μ, frequently wider at one end than the other.

On leaves of *Galopina circaeoides*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1760).

On leaves of *Labiatae*, undetermined, Woodbush, Zoutpansberg Dist., 4/8/11, E. M. Doidge (1766).

On leaves of *Barleria* sp., Amanzimtoti, Natal, 20/5/13, E. M. Doidge (6623).

On leaves of *Isoglossa Woodii*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1578).

Differs from type in size of spores and hyphopodia. Gaillard gives capitate hyphopodia 12–15 × 6–8 μ. Spores 25–28 × 8–10 μ. Asci 2-spored.

Meliola amphitricha, Fr.

Bull. Soc. Myc. 1888, p. 104.

Gaillard, Le Genre Meliola, p. 76.

Amphigenous, spots at first orbicular then confluent and irregular, velvety. Hyphae Dresden brown (R. XV), 8–10 μ thick, formed of rather short cells. Capitate hyphopodia usually alternate, 20–30 μ long, stipitate, terminal cell sub-cylindrical, or increasing in thickness from the base upwards, the apex truncate or convex, up to 15–20 μ long. Mucronate hyphopodia pale, opposite or unilateral, drawn out at the apex into a neck. Mycelial setae numerous, remotely septate, distributed over the surface of the spot, 300–400 × 10-15 μ, of an opaque, violaceous black at the base, somewhat obtuse at the summit which is paler and translucid. Perithecia globular, black, verrucose, each exterior cell being strongly convex, usually scattered, no false ostiole present, 120–200 μ diam. Asci ovoid, very briefly pedicellate, 2-spored. Spores 4-septate, constricted at the septa, elliptical, rounded at the ends, 40–50 × 18–22 μ.

On leaves of *Sapindus oblongifolius*, Stella Bush, Durban, 11/7/11 and 2/7/12, E. M. Doidge (1572 and 2520); M. Franks, 2/7/12 (8404).

On leaves of *Psychotria capensis*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1272); Stella Bush, Durban, E. M. Doidge (2521).

On leaves of *Gardenia globosa*, Kentani, 1/4/12, A. Pegler (2214), (Pegler No. 1858); Winkle Spruit, Natal, 28/5/15, E. M. Doidge (9014).

On leaves of *Grumilea globosa*, Kentani, 29/5/12, A. Pegler (2366), (Pegler No. 1875).

On leaves of *Olea laurifolia*, Woodbush, Zoutpansberg Dist., 4/8/11, E. M. Doidge (1835).

On leaves of *Olea Pegleri*, Kentani, 29/8/14, A. Pegler (8382), (Pegler No. 1948).

On leaves of shrub unknown, Krantzkloof, Natal, 14/8/14, P. van der Bijl (8377).

On leaves of *Mitriostigma axillaris*, Winkle Spruit, Natal, 28/5/15, E. M. Doidge (9013).

Meliola Rhois P. Henn.

Fungi Brasilienses, Engl. Jahrb. xvii, p. 523.

Amphigenous, forming small, black, velvety spots 1–3 mm. diam.; these are frequently confluent and cover a great part of leaf surface. Hyphae

radiating, frequently septate, 7–11 μ thick, usually constricted at the septa, buffy citrine (R. XVI); branching alternate; cells of the hyphae 17–27 μ long. Capitate hyphopodia alternate, stipitate, 18–25 μ long, terminal cell varied in form, straight or bent and usually sub-lobed (or with rounded protrusions) 14–18 × 10–11 μ. Mucronate hyphopodia fairly numerous, on separate branches, opposite, ampulliform, with a thin neck, 18–22 × 8–10 μ. Mycelial setae rather numerous, scattered, erect, rigid, simple, straight, opaque at the base, more pellucid near the acute apex 280–400 × 7–9 μ. Perithecia scattered or in groups, black, globose, granular or slightly verrucose, 180–230 μ diam. Ascus elliptical-ovate with a very short foot, 2–4-spored. Spores 4-septate; cylindrical, slightly constricted at the septae, rounded at both ends, laterally compressed 35–47 × 15–20 × 14 μ.

On leaves of *Rhus longispina*, Despatch, near Uitenhage, 24/3/11, E. M. Doidge (1239).

On leaves of *Rhus crenata*, Verulam, 3/7/13, I. B. Pole Evans (6804).

On leaves of *Rhus* sp., Mayville, near Durban, Natal, 22/7/15, J. Medley Wood (9032).

On leaves of *Harpophyllum caffrum*, Kentani, 17/2/15, A. Pegler (8851), (Pegler No. 1986).

Var. *tenuis*.—Hyphae more slender with distant articulations, capitate hyphopodia more frequently smooth.

On leaves of *Rhus* sp., Stella Bush, Durban, 2/7/12, E. M. Doidge (2519).

In his description Hennings does not mention the presence of mycelial setae; but as the remainder of the description agrees exactly with the South African specimens I have assigned them to this species.

Meliola microthecia Thum.

Flora, 1876, p. 569.

Sacc. Syll. Fung. i, p. 68.

Gaillard, Le Genre Meliola, p. 73.

Amphigenous, forming very small, thin, black colonies ½–1½ mm. diam., these frequently becoming confluent and forming larger spots. Hyphae radiating, sinuous 7–8 μ thick, branching freely, frequently constricted at the septa, snuff-brown (R. XXIX) formed of cells 18–25 μ long; branches usually alternate, frequently anastomosing. Capitate hyphopodia numerous, alternate, stipitate, 21–32 μ long; terminal cell 14–21 × 10–18 μ, at first ovoid then lobed, frequently becoming triangular with truncated angles. Mucronate hyphopodia opposite or unilateral, on separate branches, inflated in the middle and drawn out into a short neck 12–18 × 10μ. Mycelial setae very few in number (4–6 to each colony), in the neighbourhood of the perithecia, straight, cylindrical, 200–350 × 8–10 μ, translucent throughout and frequently septate, Vandyke brown (R. XXVIII) at the base, paler towards

the apex, which is rounded or ends in a broad angle. Perithecia very few in the centre of the spot, sometimes only one, black, globose, verrucose, 200–230 μ diam. Asci 3–4 spored, ovate, shortly pedicellate. Spores 4-septate, Vandyke brown, slightly constricted at the septa, oblong, broadly rounded at both ends, 48–54 × 18–22 μ.

On leaves of *Barosma scoparia*, Grahamstown, July, 1876, P. MacOwan (MacOwan 1260, de Thüm. Myc. Univers. 851).

On leaves of shrub undetermined, Paddock, Natal, 23/12/13, P. van der Bijl (8376).

Meliola sinuosa Doidge n. sp.

Amphigenous, mostly hypophyllous, forming black velvety colonies 1–5 mm. diam. Hyphae very sinuous, with opposite or unilateral branches which frequently anastomose, very variable in thickness and sometimes constricted at the septa, 5–11 μ thick, composed of cells 18–44 μ long Isabella colour (R. XXX). Capitate hyphopodia alternate or unilateral, 18–25 × 12–15 μ, stipitate; terminal cell 14–15 μ long, of various form, subcylindrical, curved or slightly lobed, apex truncate or convex; basal cell varying in length, usually short. Mucronate hyphopodia rare, 14–15 × 10–16 μ, the basal part almost hemispherical, narrowing suddenly into a slender neck which may be straight or curved, 7–8 × 2–2·5 μ. Mycelial setae numerous, scattered over the colony, simple, straight, 250–350 × 8–10 μ, opaque right up to the acute apex. Perithecia scattered, black, globose, 160–220 μ diam. Ascus elliptical-ovate, briefly pedicellate, 2-spored. Spores 4-septate, the middle cell being larger than the rest, cylindrical, rounded at both ends, slightly constricted at the septa, 50–55 × 15–18 μ.

On leaves of *Trichilia emetica*, Lemana, Spelonken, Zoutpansberg Dist., 14/8/11, E. M. Doidge (1783).

On leaves of *Trichilia* sp., Kentani, 16/12/14, A. Pegler (8786), (Pegler No. 1971).

On leaves of shrub undetermined, Springfield, Natal, 16/7/15, J. Medley Wood (9035).

M. deciduae affinis.

Meliola polytricha K. & Cke.

Grevillea, 1880, p. 72.

Sacc. Syll. Fung. i, p. 67.

Gaillard, Le Genre Meliola, p. 92.

Hypophyllous or amphigenous, forming black colonies 2–3 mm. diam. Hyphae radiating, much-branched, chestnut brown (R. XIV), 8–10 μ thick, composed of cells 18–22 μ long; branches opposite or alternate, numerous. Capitate hyphopodia alternate, stipitate, 20–25 μ long; terminal cell broadly ovate, globulose or compressed, 14–16 × 12–14 μ. Mucronate hyphopodia

fairly numerous usually on special short branches, opposite, ampulliform, tapering rather gradually to the neck, about 18 × 7 μ. Mycelial setae numerous, simple, more or less flexuose, opaque right to the acute tip, 250–300 × 9–10 μ. Perithecia numerous, scattered, 160–200 μ diam., black, globose, very minutely verrucose. Asci not seen. Spores 4-septate, cylindrical, rounded at both ends, 45–55 × 16-18 μ. Conidiiferous mycelium paler and more slender, conidia borne on upright flexuose conidiophores, clavate, 3–5-septate, 50–70 × 6–10 μ.

On leaves of shrub unknown, Inanda, J. Medley Wood (Wood 222).

On leaves of *Osyris compressa* near Grahamstown, 1876, P. MacOwan (MacOwan, No. 1256).

On leaves of *Pittosporum viridiflorum*, Claridge, Natal, 31/5/15, E. M. Doidge (8996).

This description, taken from Wood's duplicate of the type specimen, differs in many essentials from that given by Gaillard (*Le Genre Meliola*, p. 92).

MacOwan (No. 1262) on leaves of *Cunonia capensis* approximates this species, but the specimens examined are parasitised by *Dimerium intermedium* Syd., and no *Meliola perithecia* were seen.

Meliola rigida Doidge n. sp.

Amphigenous, forming rusty black colonies of varying size, sometimes, especially in the conidial stage, up to 1 cm. diam. Hyphae rigid, 7–8 μ thick, sepia-warm sepia (R. XXIX), composed of cells 18–25 μ long, branches usually opposite, hyphopodia very briefly stipitate, 14–18 μ long, terminal cell globose or broadly ovate, sometimes slightly curved, 10–12 × 8–10 μ. Mucronate hyphopodia not very numerous, paler, opposite, narrowed above into a short neck, about 18 μ long. Mycelial setae not very numerous, black, opaque almost to the acute apex, more or less flexuose, 250–600 μ long by 10–11 μ. Perithecia scattered, black, globose, verrucose, 180–220 μ diam. Ascus ovate, briefly stipitate, 3-spored. Spores 4-septate, slightly constricted, oblong, compressed, rounded at both ends, 40–45 × 16–20 μ.

On leaves of *Xymalos monospora*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1775). Tabankulu, Transkei, 15/3/15, G. Fraser (8890). Buccleuch, Natal, 18/3/15, I. B. Pole Evans (8894).

Meliola falcata Syd.

Annales Mycologici, vol. x, no. 1, 1912.

Amphigenous, but most frequently epiphyllous, forming velvety black orbicular colonies 2–4 mm. broad, often confluent, and then irregular in outline. Hyphae snuff-brown (R. XXIX), anastomosing, 6–7 μ thick; capitate hyphopodia alternate, 22–25 μ long, apical cell up to 10 μ broad; mucronate hyphopodia opposite, 15–18 μ long. Mycelial setae very numerous, simple,

curved, often falcate, opaque, 175–250 × 6–9 μ, apex acute. Perithecia hidden among the numerous mycelial setae, globose, verrucose, black, 200–230 μ diam., asci 2–4-spored; spores oblong, rounded at both ends, 4-septate, constricted, similar in colour to the hyphae, 38–48 × 16–20 μ.

On leaves of *Plectronia ventosa*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1577); Durban Beach, 2/7/11, I. B. Pole Evans (1591).

On leaves of *Pavetta* sp., Tongaat, Natal, 12/9/13, P. van der Bijl (6952).

On leaves of *Plectronia* sp. (?), Winkle Spruit, Natal, 28/5/15, E. M. Doidge (9005); Springfield, Natal, 14/7/15, J. Medley Wood (9017).

On leaves of shrub undetermined, Mayville, Natal, 22/7/15, J. Medley Wood (9030).

Meliola arcuata Doidge.

Forms small, velvety, irregular-orbicular colonies 1–2 mm. diam. Hyphae branched, sinuate, frequently septate, Vandyke brown (R. XXVIII), about 10·5–11 μ thick, finally anastomosing. Capitate hyphopodia alternate, shortly stipitate, 20–29 × 10·5–11 μ; terminal cell irregularly ovoid, dentate or lobulate. Mucronate hyphopodia scarce, opposite, 14–18 × 7–9·5 μ. Mycelial setae numerous, simple, arcuate or sometimes almost straight, black, opaque, apex acute, of uneven thickness, 7–11 μ thick, 295–330 μ long. Perithecia hidden among the mycelial setae, black, granular, 115–150 μ diam. Asci 2-spored, evanescent. Spores ellipsoid-oblong, rounded at both ends, 4-septate, slightly constricted at the septa, 50–54 × 14–16 μ.

On stems of *Viscum* sp., Kentani, 1/6/12 (2364), 4/8/14 (8389), (Pegler No. 1949).

Meliola Woodiana Sacc. & Syd.
Hedwigia, 1899, p. 132.
Sacc. Syll. Fung. XVI, p. 415.

Hypophyllous, forming black, velvety sub-orbicular spots up to 4 mm. diam., frequently confluent. Perithecigerous mycelium radiating, branched, composed of hyphae, 8–9 μ thick, Natal brown (R. XL), septate; cells 18–25 μ long; branches not numerous, opposite. Capitate hyphopodia alternate, stipitate, 25–35 μ long, terminal cell ovate or slightly angular 18–25 × 7–11 μ. Mucronate hyphopodia on separate short branches, not numerous, opposite, paler, with a short, rather thick neck, 11–18 μ long. mycelial setae most numerous near perithecia, simple, black, rigid, arcuate, tapering slightly to blunt, translucent apex, 300–400 × 9–11 μ. Perithecia black, globose, granulose, ca. 200 μ diam. Asci 2–3-spored. Spores oblong, obtuse at both ends, 4-septate, constricted 47–54 × 18 μ. Conidiiferous mycelium filiform, conidiophores sub-simple, ascending, black-fuliginous, above paler and nodulose, 300–350 × 7–8 μ. Conidia obclavate, 4-septate, 52–55 × 9–11 μ, pale fuliginous.

On sub-coriaceous leaves of an unknown tree, Durban, Natal, J. Medley Wood (Wood 5467).

Meliola furcillata Doidge n. sp.

Amphigenous, forming thin black spots 2–3 mm. diam. Hyphae straight or sinuous, tawny olive (R. XXIV), 6–8 μ thick, with opposite or unilateral branches, cells mostly about 18–21 μ long. Capitate hyphopodia alternate or unilateral, briefly stipitate 18–21·5 μ long; terminal cell ovoid, straight, incurved or recurved 10·5–12·5 × 7–9 μ. Mucronate hyphopodia numerous, interspersed among the capitate hyphopodia, not on separate branches, 14–18 μ long, ampulliform, with a rather long neck which is frequently curved. Mycelial setae more numerous in the neighbourhood of the perithecia, 330–400 × 7 μ, once or twice abruptly geniculate near the base, otherwise straight, more or less torulose, opaque at the base, more translucent and with a slight constriction below the apex, which terminates in a single mucronate point or is bi- or tridentate. Perithecia scattered or in small groups, black, globose, verrucose, 160–180 μ diam. Asci 2-spored. Spores 4-septate, cylindrical, broadly rounded at both ends, constricted at the septa, 43–45 × 16–18 μ.

On leaves of *Maesa rufescens*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (1573).

Meliola varia Doidge n. sp.

Amphigenous, forming small, black colonies 1–2 mm. diam. Hyphae sinuate, and irregular in thickness, 7–9 μ, argus brown (R. III) cells 18–25 μ long, branching irregular, usually alternate or unilateral. Capitate hyphopodia remote, not numerous, alternate or unilateral 21–25 μ long, terminal cell globular-ovoid, 14–16·5 × 10·5–12 μ. Mucronate hyphopodia very rare, paler, slender, tapering about 11 × 5–6 μ. Mycelial setae very numerous, 180–220 μ long, lower part opaque 160–190 × 10 μ, above more translucent and branching in various ways, some dividing at once into 3 short branches about 18 μ long, others producing 2 thick, spreading branches 18–30 × 8 μ, each of these dividing into 2–3 smaller branches. Ultimate branches all bi- to trifid. Perithecia scattered, black, globose, collapsing slightly after drying, verrucose, 160–180 μ diam. Asci not seen. Spores 4-septate, scarcely constricted at the septa, cylindrical, rounded at the ends 45–50 × 16–18 μ, middle cell sometimes larger than the rest.

On leaves of *Cissus rhomboidea*, Winter's Kloof, Natal, 26/6/11, E. M. Doidge (1639).

Meliola bifida Cke.

Grevillea 1880, p. 15.

Sacc. Syll. Fung. i, p. 62.

Gaillard, Le Genre Meliola, p. 99.

Forms conspicuous, black, velvety spots, chiefly on stems. Mycelium snuff-brown (R. XXX), much branched. Hyphae 7–8 μ thick, frequently septate, cells 15–18 μ long, branches opposite. Capitate hyphopodia very numerous, crowded, mostly opposite, 15–18 μ long; terminal cell subcylindrical to ovate, convex, frequently compressed, 11–14 × 7–8 μ. Mucronate hyphopodia not seen. Mycelial setae very numerous, erect, 250–325 μ long, 10 μ thick at the base; bifid near apex, branches 10–90 μ long, 6–7·5 μ thick, simple or bifid, apices acute; in many cases ultimate branches also bifid or trifid. Perithecia numerous, completely concealed among the setae, black, globose, verrucose, 250–300 μ diam. Asci 2-3-spored. Spores brown, 4-septate, cylindrical, rounded at both ends, slightly constricted at the septa, 42–50 × 14–16 μ.

On stems and leaves of *Osyridicarpus natalensis*, Inanda, Natal, J. Medley Wood; Springfield, Natal, 14/7/15, J. Medley Wood (9020).

Meliola leptidea Syd.

Annales Mycologici, vol. x, no. 1, 1912.

Epiphyllous, forming velvety black colonies 2–4 mm. diam., frequently confluent. Hyphae branched, chestnut brown (R. XIV) 8–11 μ thick; capitate hyphopodia very numerous, closely crowded, opposite or alternate, 18–28 μ long, terminal cell ovate or globular, obtuse, 10–15 μ thick; mucronate hyphopodia not so numerous, up to 25 μ long. Perithecia congregated in the centre of the colony, but not crowded together, black, globose, collapsing somewhat when dry, asperulous, 250–300 μ diam. Mycelial setae very numerous, 200–300 μ long, 8–11 μ thick, opaque at the base, dividing above into two long (up to 130 μ) spreading, slightly incurved branches, these branches being again divided into two branches of various length (30–80 μ), bifurcate at the apex. Asci ovate 50–60 × 28–40 μ, 2–3-spored; spores oblong, broadly rounded at both ends, 4-septate, constricted at the septa, chestnut brown, 45–55 × 15–20 μ.

On leaves of *Cussonia* sp., Woodbush, Zoutpansberg Dist., 27/7/07, C. E. Legat (405).

On leaves of *Cussonia umbellifera*, Woodbush, Zoutpansberg Dist., 3/8/11, E. M. Doidge (1774).

Species Excludendae.

Meliola capnodioides Thuem.	=	*Meliola amphitricha*, Fr.
Meliola Psilostomae Thuem.	=	*Dimerium Psilostomatis* (Thuem.) Sae.
Meliola quinquespora Thuem.	=	*Meliola inermis* K. & Cke.
Meliola MacOwaniana Thuem.	=	*Dimerium MacOwanianum* (Thuem.).
Meliola Sclerochitonis Kalch.	=	*Asterina fimbriata* K. & Cke.

CAPNODIUM.

Mycelium superficial, crustaceous, formed of short, thick-walled cells.

Perithecia superficial, globose to pyriform, membranaceous or carbonaceous. Asci ovate to clavate, 8-spored. Spores brown, muriform. Conidia very various, and produced in great numbers.

A large number of fungi have been collected in South Africa on various hosts probably belonging to this genus, but as no perithecia have yet been found on any of these it is impossible to diagnose them accurately. A list of the hosts is appended:

Capnodium spp.

On leaves and stems of *Citrus* spp. Lemana, Zoutpansberg Dist., 20/8/08 (504), 14/8/11, E. M. Doidge (1790).

On leaves of *Pyrus malus*, March, 1906, C.P. (39).

On *Asparagus plumosus*, Table Mt., Natal, 18/5/11, C. Fuller (1676); Kentani, C.P., 4/3/12, A. Pegler (8886).

On leaves of *Grewia occidentalis*, Kentani, 1/6/12, A. Pegler (2365).

On leaves of *Celastrus* sp., Butterworth, 19/3/12, A. Pegler (2188).

On leaves of *Royena* sp., Kentani, 4/3/12, A. Pegler (2192).

HOST INDEX.

Host.	*Fungus.*
Anastrabe integerrima	Meliola Peglerae.
Apodytes dimidiata	Phaeodimeriella capensis.
Barleria sp.	Meliola microspora, var. africana.
Barosma scoparia	Meliola microthecia.
Boscia caffra	Meliola Bosciae.
Buddleia auriculata	Meliola inermis.
Buddleia pulchella	Meliola inermis.
Buddleia salvifolia	Meliola inermis.
Canthium sp.	Meliola glabra.
Celastrus buxifolius	Dimerium MacOwanianum.
Celastrus sp.	Meliola ditricha.
Cissus rhomboidea	Meliola varia.
Curtisea faginea	Meliola ganglifera.
Cussonia umbellifera	Meliola leptidea.
Cussonia sp.	Meliola leptidea.
Dovyalis rhamnoides	Meliola conferta.
Eriosema sp.	Parodiella perisporioides.
Eugenia Zeyheri	Meliola cladotricha. Zukalia transvaalensis.
Galopina circaeoides	Meliola microspora, var. africana.
Gardenia globosa	Meliola amphitricha.
Grumilea globosa	Meliola amphitricha.
Gymnosporia spp.	Dimeriella annulata. Dimerium Gymnosporiae. Meliola speciosa.

Host.	*Fungus.*
Hippobromus alatus	Meliola capensis.
Indigofera sp.	Parodiella perisporioides.
Isoglossa Woodii	Meliola microspora, var. africana.
Limnanthemum Thunbergianum	Parodiella congregata.
Maerua pedunculosa	Meliola Bosciae.
Maesa rufescens	Meliola furcillata.
Meliola Rhois	Dimerium intermedium.
Meliola sp.	Dimerium intermedium.
Mitriostigma axillaris	Meliola amphitricha.
Nuxia floribunda	Meliola Hendeloti.
Nuxia tomentosa	Meliola Hendeloti.
Olea laurifolia	Meliola amphitricha.
Olea Pegleri	Meliola amphitricha.
Osyridicarpus natalensis	Meliola bifida.
Osyris compressa	Meliola polytricha. Dimerosporium osyridis.
Pavetta Bowkeri	Balladyna velutina.
Pavetta natalensis	Balladyna velutina.
Pavetta obovata	Balladyna velutina. Meliola falcata.
Pittosporum viridiflorum	Meliola polytricha.
Plectronia ciliata	Dimerium Psilostomatis.
Plectronia Guenzii	Dimerium Psilostomatis.
Plectronia ventosa	Meliola falcata.
Podocarpus elongata	Meliola Podocarpi.
Podocarpus Thunbergii	Meliola peltata. Meliola Podocarpi.
Psoralea decumbens	Parodiella perisporoides.
Psychotria capensis	Meliola amphitricha.
Pygeum africanum	Meliola manca.
Rubus rigidus	Meliola manca.
Rhus crenata	Meliola Rhois.
Rhus longispina	Meliola Rhois.
Rhynchosia sp.	Parodiella Schimperi.
Sapindus oblongifolius	Meliola amphitricha.
Strophanthus speciosus	Meliola Strophanthi.
Toddalia lanceolata	Meliola Toddaliæ.
Tricalysia floribunda	Balladyna velutina.
Tricalysia lanceolata	Balladyna velutina.
Trichilia emetica	Meliola sinuosa.
Trichocladus crinitus	Meliola torta.
Vernonia angulifolia	Dimeriella claviseta.

Host.	*Fungus.*
Vigna angustifolia	Parodiella perisporioides.
Viscum, sp.	Meliola arcuata.
Xymalos monospora	Meliola rigida.

Descriptions of New Species.

Dimeriella claviseta Doidge n. sp.

Epiphylla, maculas effusas efformans; mycelio ex hyphis flexuosis, septatis, fuscidulis, 3–3·5 μ crassis composito; peritheciis superficialibus, sparsis v. laxe gregariis, sub-hemisphaericis, atris, carbonaceis, 90–115 μ diam., praecipue basi v. in parte inferiore 9–15 setulis obsitis; setulis septatis clavatis, 15-55 μ long, basi 3·5–7 μ crassis, ad apicem incrassatis, truncatis, diverse lobatis; ascis numerosis, paraphysatis, 8-sporis, sessilibus, cylindraceo-clavatis, apice rotundatis, 40–50 × 18–20 μ; paraphysibus filiformibus, simplicis, hyalinis; sporidiis conglobatis v. distichis, hyalinis, 1-septatis, sub-constrictis 15–18 × 5–7 μ.

Hab. in foliis *Vernoniae angulifoliae*, Winkle Spruit, Natal, 6/7/11, leg. E. M. Doidge (2511).

Phaeodimeriella Capensis Doidge n. sp.

Hypophyllis vel amphigenis, maculis effusis radiantibus, atris, 3–5 mm. diam., efficiens; hyphis radiantibus, 6–7 μ crassis; hyphopodiis continuis, alternis vel sub-oppositis; ramis oppositis; peritheciis numerosis, atris, globulosis, carbonaceis, verruculosis, 140–160 μ diam., setulosis; setis 15–25, uncinatis, circ. 55–65 μ long., basi 5 μ crassis, ad apicem obtusum leniter attenuatis; ascis numerosis, paraphysatis, ellipticis, octosporis, apice incrassatis, sessilibus, 55–70 × 12–14 μ; sporidiis sub-distichis, fuscis, 1-septatis, ellipsoidis, ad septum leniter constrictis, 16–18 × 4–5 μ; pycnidiis peritheciis similis, conidiis ellipsoidis, continuis, circ. 14 × 3 μ.

In foliis *Apodytis dimidiatæ*, Knysna, C.B.S., 3/6/12, leg. P. J. Pienaar (2426).

Zukalia Transvaalensis, Doidge n. sp.

Epiphylla, maculas tenues effusas efficiens; hyphis radiatis, ramosis, anastomosantibus, 7–8 μ crassis, e cellulis 30–32 μ longis compositis; hyphopodiis unilateralibus, plerumque laterioribus quam longis 8–10 × 11–14 μ, peritheciis sparsis, numerosis, globosis, atris, 130–160 μ diam.; ascis octosporis, ellipticis v. ovatis, plerumque leniter curvatis, 70–90 × 18–22 μ; paraphysibus nullis; sporidiis distichis v. trifariis, clavatis, hyalinis, 5-septatis, utrinque obtusis, 45–55 × 5–7 μ.

Hab. in foliis *Eugeniae Zeyheri*, Woodbush, Zoutpansberg Dist., 3/8/11, leg. E. M. Doidge (1759).

Meliola Natalensis Doidge n. sp.

Amphigena, plerumque epiphylla, maculas atras carbonaceas, rotundatas, 2–3 mm. diam. efficiens; mycelio radiante ramoso; hyphis fuscis, subsinuosis et saepe ad septa constrictis, 6–8 μ crassis, e cellulis 14–18 μ long compositis; ramis oppositis; hyphopodiis capitatis alternis v. unilateralibus, stipitatis, 18–21 μ long, cellula basali breve, prope hyphas angustiore; capitulo latiore quam longo 2–3 lobato, quoque lobo bi-lobulato, 12–14 × 16–20 μ; hyphopodiis mucronatis raris, sparsis, tenuibus, rectis v. recurvatis, ca. 16–18 × 4–5 μ; setis mycelicis nullis; peritheciis aggregatis, atris, globosis, carbonaceis 130–150 μ diam., rugulosis, appendiculis numerosis, subcylindraceis, larviformibus, acclivis, 40–45 × 18 μ, apice interdum recurvatis; ascis bisporis; sporidiis 3-septatis, rectis v. leniter curvatis, ad septa valde constrictis, 40–44 × 14–16 μ.

Hab. in foliis arboris ignotae, Umgeni prope Durban, Natal, 27/5/15, leg. E. M. Doidge (8980).

Meliola conferta Doidge n. sp.

Amphigena, maculas atras, subcrustaceas 1–3 mm. diam. efficiens; hyphis fuscis, rectis, ramosis; 6–8 μ crassis, ex cellulis 11–18 μ longis compositis; ramis numerosis, oppositis; hyphopodiis capitatis numerosissimis, confertis, oppositis, interdum unilateralibus vel alternis 14–18 μ long; cellula superiore diverse lobata, plerumque bi-triloba, quoque lobo bilobulato, 9–14 × 11–14 μ; hyphopodiis mucronatis pallidis, 18 μ long.; setis mycelicis nullis; peritheciis (vix maturis) paucis, sparsis, 100–130 μ diam., atris, verrucosis, quibusdam cellulis externis usque 18 μ productis; ascis non visis; sporidiis atro-brunneis, 3-septatis, ad septa vix constrictis, utrinque attenuatis et rotundatis, rectis vel leniter curvatis, 43–50 × 18–25 μ.

Hab. in foliis arboris ignotae, prope Durban, 14/5/1897, leg. J. Medley Wood (345), (Wood 6467).

Meliola Podocarpi Doidge n. sp.

Amphigena, plerumque epiphylla, maculas atras tenues, 2–5 mm. diam. efficiens; hyphis rectis v. sub-sinuosis, 6–7 μ crassis, fuscis; hyphopodiis capitatis alternis, breviter stipitatis, 14–15 μ long, cellula superiore globosa, 10–12 × 10–11 μ; hyphopodiis mucronatis non visis; setis mycelicis nullis; peritheciis sparsis v. sub-aggregatis, atris, globosis, verrucosis, 200–250 μ diam.; ascis 2–4 sporis; sporidiis 3-septatis, ad septa valde constrictis, leniter curvatis, utrinque attenuatis et rotundatis, 50–56 × 14–16 μ.

Hab. in foliis *Podocarpi Thunbergii*, Woodbush, Zoutpansberg Dist., 3/8/11, leg. E. M. Doidge (1748); Knysna, C.B.S., leg. P. J. Pienaar (2436).

In foliis *Podocarpi elongatae*, Fort Cunningham, Toise River, 20/3/15, (8897).

Meliola speciosa Doidge n. sp.

Maculis hypophyllis, rotundatis, atris 1–5 mm. diam., hyphis ramosis, demum anastomosantibus, usque ad 11 μ crassis, brunnosis, cellulis ca. 18 μ longis compositis; hyphopodiis capitatis numerosis, speciosis, alternis, stipitatis; cellula basali 7–11 × 5·5–7 μ, prope hyphae angustiora, capitulo latiore quam longiore, 18–21·5 × 21·5–25 μ, irregulari, 2–4 lobo, quoque lobo leviter bilobato; hyphopodiis mucronatis raris, pallidioribus, tenuibis, arcuatis, ca. 25 × 7 μ; setis nullis; peritheciis aggregatis, atris, 125–265 μ diam., basi appendiculis numerosis, subcylindraceis, basi 18 μ crassis; ascis 2-sporis, evanescentibus; sporidiis ellipsoideis, 3-septatis, leniter constrictis, brunneis 52–61 × 21·5–25 μ; conidiophoris erectis, atrofuscis, septatis, ca. 150 μ longis; conidiis fusoidibus, 4-septatis, fuscis.

M. mancae affinis.

Hab. in foliis *Gymnosporiae* sp., Woodbush, Zoutpansberg Dist., 2/8/11, leg. E. M. Doidge (1740).

Meliola torta Doidge n. sp.

Amphigena, maculas atras tenues, 5–10 mm. diam. efficiens; hyphis tenuibus, 6–7 μ crassis, tortuosis, anastomosantibus, cellulis 25–36 μ long; ramis irregularibus plerumque unilateralibus; hyphopodiis capitatis tenuibus, cellula superiore 14–25 × 14–20 μ, diverse lobata, torta, apice obtusa v. convexa; hyphopodiis mucronatis, ampullaceis, 20–36 μ long.; setis mycelicis non numerosis, sparsis, rectis, simplicibus, basi 10–11 μ cr., apice acutis; peritheciis paucis, sparsis, atris, globulosis, rugulosis, 160–250 μ diam.; ascis numerosis, 8-sporis; sporidiis distichis v. conglobatis, 3-septatis ad septa vix constrictis, clavatis, 25–30 × 7–11 μ.

Hab. in foliis *Trichocladi criniti*, Izeleni, Kingwilliamstown Dist., 8/6/15, (9064).

Meliola peltata Doidge n. sp.

Amphigena; maculas atras, rotundatas, pilosas, 3–7 mm. latas, interdum confluentes efficiens; mycelio peritheciigero pseudoparenchymatico, peltiformi v. flabelliformi, composito ex hyphis fuscis, ramossissimis, crebre septatis, cellulis ca. 5·5–7 × 11 μ; hyphopodiis capitatis alternis, ad ramos appressis, subclavatis, stipitatis, 39–50 μ longis, cellula superiore compressa, plerumque tuberculata v. sublobata, 28–32 μ long.; hyphopodiis mucronatis non visis; setis mycelicis numerosis, simplicibus, rectis, 10–11 μ crassis, usque ad 850 μ longis, nigris, opacis, apice acuto pallidiore; peritheciis paucis, in plagulis sparsis, atris, scabris sed non verrucosis; ascis non visis; sporidiis 3-septatis, nonnunquam 2-septatis, ad septa constrictis, utrinque ca. 50 × 29 μ; mycelio conidiifero inter mycelio peritheciigero intertextis, tenuiore, pallidiore; conidiophoris brunneis, torulosis, flexuosis, usque ad 500 μ longis; conidiis fusiformibus, non septatis, 16–18 × 10–11 μ.

Hab. in foliis *Podocarpi Thunbergii*, Knysna, C.B.S., 3/6/12, P. J. Pienaar (2436).

Meliola ditricha (K. & Cke.) Doidge.

Asterina ditricha K. & Cke. Grevillea, 1880, p. 3.

Hypophylla, effusa, maculas, tenues, atras, 2–5 mm. diam. efficiens; hyphis radiantibus, brunneis, 7–10 μ crassis, ex cellulis 18–21 μ long. compositis; ramis plerumque oppositis, anastomosantibus; hyphopodiis capitatis alternis, stipitatis, 25–30 μ long., cellula superiore irregulare, diverse lobata, 18–23 × 14–22 μ; hyphopodiis mucronatis numerosis, oppositis v. unilateralibus, tenuibus 21–25 × 7–8 μ; setis nullis; peritheciis non numerosis, atris, globosis (immaturis) ascis non visis, sporidiis 4-septatis, atro-brunneis, ad septa constrictis, utrinque rotundatis, 54 × 25 μ; mycelio conidiophoro tenui; conidiophoris erectis, ca. 70–80 μ long., conidiis fusoidibus, 3-septatis, 15–18 × 4–8 μ.

Hab. in foliis *Celastri* sp., Inanda, Natal, J. Medley Wood (Wood No. 3).

Meliola Strophanthi Doidge n. sp.

Amphigena, plerumque, hyphophylla, sub-crustacea; maculas minutas, atras, orbiculares, 1–2 mm. diam., efficiens: mycelio peritheciigero ex hyphis flexuosis, 6–9μ crassis, e cellulis ca. 18μ longis compositis, brunneis, ramis oppositis; hyphopodiis capitatis alternis, breviter stipitatis, 20–25 μ long., cellula superiore cylindrica, recta v. leniter curvata, convexa, 16–18 × 7–9 μ; hyphopodiis mucronatis paucis, ampullaceis, ca. 18 μ long.; setis mycelicis nullis, peritheciis paucis, congregatis, atris, globosis 215–250 μ diam., verrucosis; ascis maturis non visis; sporidiis 4-septatis, cylindricis, ad septa vix constrictis, utrinque rotundatis 40–45 × 16–18 μ; mycelio conidiifero inter mycelio peritheciigero intertextis, pallidiore, tenuiore; conidiophoris numerosis, erectis, septatis, brunneis 180–200 μ long.; conidiis fusiformibus, 3-septatis, 18–32 × 5–9 μ.

Hab. in foliis *Strophanthi speciosi*, Woodbush, Zoutpansberg Dist., 3/8/11, leg. E. M. Doidge (1781).

Meliola Bosciae Doidge n. sp.

Epiphylla, rarius hypophylla; pelliculas tenues, suborbiculares, nigras, 2–3 mm. latas formans; hyphis radiantibus, circa perithecia crebre anastomosantibus, fuscis, septatis, plerumque curvatis, vermiculatis, 5·5–9 μ crassis; ramis oppositis, v. unilateralibus; hyphopodiis capitatis alternis v. unilateralibus, rarius oppositis, breviter stipitatis, 14–20 μ long., cellula superiore 10·5–16 μ long., scabra, convexa, truncata v. sub-lobata; hyphopodiis mucronatis plerumque prope perithecia, in ramis separatis v. inter hyphopodia capitata sparsis, oppositis v. unilateralibus, ampullaceis, apice interdum uncinatis, 14–18 μ long., basi ca. 7 μ crassis; setis mycelicis nullis;

peritheciis globosis, atris, verrucosis, 160–180 μ diam., appendiculis 6–12 sparsis, simplicis, 70–90 μ long., basi sub-bulbosis, ca. 6 μ crassis, ad apicem obtusum pellucidum attenuatis, rectis v. infra apicem abrupte curvatis; ascis 2–3 sporis, ovatis, breviter pedicellatis, mox evanescentibus; sporidiis atro-brunneis, 4-septatis constrictis, utrinque rotundatis, 39–47 × 10·5–17·5 μ.

Hab. in foliis *Bosciae Caffrae*, Winkle Spruit, Natal, 6/7/12, leg. E. M. Doidge (2510).

Meliola microspora Pat. et Gaill.

Var. *africana* Doidge, var. nov.

Hyphopodiis capitatis 20–21·5 × 7·8 μ, cellula superiore ovata 14–16 μ long.; sporidiis 26–32·5 × 10·5–14 μ.

A typo differt hyphopodiis capitatis majoribus et sporidiis crassioribus.

Meliola Toddaliae Doidge n. sp.

Amphigena, maculas atras velutinas 2–3 mm. diam. efficiens; hyphis fuscis, ramosis, 7–10 μ crassis, cellulis 18–25 μ longis, ramis plerumque oppositis, anastomosantibus, hyphopodiis capitatis numerosis, oppositis, 18–20 μ long., stipitatis, cellula superiore sub-ovata et leniter curvata, saepe compressa, 14–16 × 8–11 μ; hyphopodiis mucronatis non numerosis, ampullaceis, 18–20 × 8–10 μ; setis mycelicis numerosis, simplicibus, rectis, demum opacis, plus minusve torulosis, 300–350 × 8–10 μ; peritheciis sparsis, in setis mycelicis absconditis, atris, globulosis, verrucosis, 200–250 μ diam.; ascis 3–4 sporis; sporidiis 4-septatis, leniter constrictis, cylindricis, utrinque rotundatis, compressis, 47–55 × 18–21 × 14 μ.

Hab. in foliis *Toddaliae lanceolatae*, Kentani, 16/12/14, leg. A. Pegler, (8788).

Meliola sinuosa Doidge n. sp.

Amphigena, plerumque hypophylla, maculas atras, velutinas, 1–5 mm. diam. efficiens; hyphis sinuosis, 5–11 μ crassis, interdum ad septa constrictis, cellulis 18–44 μ longis, ramis oppositis v. unilateralibus, saepe anastomosantibus; hyphopodiis capitatis alternis v. unilateralibus, 18–25 × 12–15 μ stipitatis, cellula superiore 14–15 μ long. forma varia, subcylindrica, curvata v. sub-lobata, apice truncata v. convexa; hyphopodiis mucronatis raris, 14–15 × 10–16 μ; setis mycelicis numerosis, sparsis, erectis, simplicibus, 250–350 × 8–10 μ, opacis; peritheciis sparcis, atris, globulosis, 160–220 μ diam.; ascis ellipticis-ovatis, breviter pedicellatis, bisporis, sporidiis 4-septatis, cellula media majore, cylindricis, utrinque rotundatis, ad septa leniter constrictis, 50–55 × 15–18 μ.

Hab. in foliis *Trichiliae emeticae*, Lemana, Spelonken, Zoutpansberg Dist., 14/8/11, leg. E. M. Doidge (1783).

Meliola rigida Doidge n. sp.

Amphigena, maculas atras usque ad 1 cm. diam. efficiens; hyphis rigidis, 7–8 μ crassis, brunneis, cellulis 18–25 μ longis, ramis plerumque oppositis; hyphopodiis capitatis numerosis, oppositis breviter stipitatis 14–18 μ long., cellula superiore ovata-globulosa 10–12 × 8–10 μ; hyphopodiis mucronatis non numerosis, pallidioribus, oppositis circ. 18 μ long.; setis mycelicis erectis, simplicis, plus minusve sinuosis, atris, opacis, 250–600 × 10–11 μ; peritheciis sparsis, atris, globulosis, verrucosis, 180–220 μ diam.; ascis ovatis, breviter stipitatis, 3-sporis; sporidiis 4-septatis, leniter constrictis, oblongis, compressis, utrinque rotundatis, 40–45 × 18–20 μ.

In foliis *Xymalos monosporae*, Woodbush, Zoutpansberg Dist., 3/8/11, leg, E. M. Doidge (1775).

Meliola furcillata Doidge n. sp.

Amphigena, maculas tenues, atras, 2–3 mm. diam. efficiens; hyphis rectis v. sinuosis, fuscis, 6–8 μ crassis, cellulis 18–21 μ long., compositis, ramis oppositis v. alternis v. unilateralibus, breviterstipitatis 18–21·5 μ long., cellula superiore ovata, recta, incurvata v. recurvata, 10·5–12·5 × 7–9 μ; hyphopodiis mucronatis inter hyphopodia capitata intersparsis, 14–18 μ long., ampullaceis, collo longiore plerumque curvata; setis mycelicis prope perithecia congregatis, 330–400 × 7 μ, basi opacis semel v. bis abrupte geniculatis, superne rectis, rigidis, pellucidis, plus minusve torulosis, prope apicem leniter constrictis, apice mucronatis v. 2–3 dentatis; peritheciis sparsis v. sub-aggregatis, atris, globosis, verrucosis, 160–180 μ diam.; ascis 2-sporis; sporidiis 4-septatis, cylindricis, utrinque, rotundatis, ad septa constrictis, 43–45 × 16–18 μ.

Hab. in foliis *Maesae rufescentis*, Amanzimtoti, Natal, 10/7/11, E. M. Doidge (Pole Evans 1573).

M. bidentatae affinis.

Meliola varia Doidge n. sp.

Amphigena, plagulas minutas, atras, 1–2 mm. diam., efficiens; hyphis sinuatis irregulariter 7–9 μ crassis; brunneis, cellulis 18–25 μ long., compositis; ramis plerumque alternis v. unilateralibus; hyphopodiis capitatis remotis, non numerosis, alternis v. unilateralibus, 21–35 μ long., cellula superiore ovata-globosa, 14–15 × 10·5–12 μ; hyphopodiis mucronatis rarissimis, pallidioribus tenuibus ca. 11 × 5–6 μ; setis mycelis numerosis, 180–220 μ longis erectis, rigidis, stipite opaco, simplice, 160–190 × 10 μ; superne ramosis, pellucidis, variis, aliis in ramos ternos breves (ca. 18 μ) apice bifurcatos divisis, aliis in ramos duos (18–30 × 8 μ) patentes divisis, ramis iterum in ramulos duos v. ternos brevissimos ad apicem bi v. trifurcatos divisis; peritheciis sparsis atris, globosis, in sicco leniter collapsis, verrucosis, 160–180 μ diam., ascis non visis; sporidiis 4-septatis, ad septa vix constrictis, cylindricis, utrinque rotundatis, 45–50 × 16–18 μ.

Hab. in foliis *Cissi rhomboideae*, Winter's Kloof, Natal, 26/6/11, E. M. Doidge (1639).

Meliola bifida Cke. Char. emend.

Caulicola et amphigena, maculas atras velutinas efficiens; mycelio ramosissimo ex hyphis 7–8 μ cr. septatis composito, cellulis 15–18 μ long.; ramis oppositis; hyphopodiis capitatis numerosissimis, confertis, oppositis, 15–18 μ long.; cellula superiore cylindrica-ovata, convexa, 11–14 × 7–8 μ; hyphopodiis mucronatis non visis; setis mycelicis numerosissimis, rigidis, 250–325 μ long.; basi 10 μ cr., apice bifidis, ramis 10–90 μ long., saepe bifidis, ramis ultimis quoque apice bi- v. trifidis; peritheciis inter setis absconditis, atris, verrucosis, 250–300 μ diam.; ascis 2–3-sporis, sporidiis brunneis, 4-septatis, cylindraceis, utrinque rotundatis, ad septa leniter constrictis, 42–50 × 14-16 μ.

Hab. in foliis *Osyridicarpi natalensis*, Natal, 14/7/15, leg. J. Medley Wood (9020).

SUMMARY.

An account is given of the Perisporiaceæ in the Union Mycological Herbarium; this is a group of fungi well represented in South Africa, but up to the present only a few species have been described or recorded. Descriptions are given of forty-five fungi belonging to the Perisporiaceæ, of which thirty-two are *Meliolas* and seventeen are species hitherto undescribed. Each species is illustrated by drawings made to scale with the aid of the camera lucida.

BOTANICAL LABORATORIES OF THE UNION OF SOUTH AFRICA, PRETORIA.

EXPLANATION OF PLATES LVII—LXVI.

PLATE LVII.

FIG.

1. *Balladyna velutina* (B. & C.) v. Höhn. (*a*) Mycelium; (*b*) setae; (*c*) asci; (*d*) ascospores.
2. *Dimeriella annulata* Syd. (*a*) Fungus on leaf; (*b*) perithecia; (*c*) ascus and spores; (*d*) mycelium and sarciniform conidia.
3. *Dimeriella claviseta* Doidge n. sp. (*a*) Perithecia; (*b*) asci; (*c*) spores.
4. *Dimerium intermedium* Syd. (*a*) Pycnidium; (*b*) perithecia; (*c*) asci with paraphyses and spores.
5. *Dimerium MacOwanianum* (Thuem.) Doidge. (*a*) Mycelium; (*b*) perithecium; (*c*) spores.

PLATE LVIII.

FIG.

6. *Dimerium Psilostomatis* (Thuem.) Sacc. (*a*) Mycelium and perithecia; (*b*) spores.
7. *Dimerium Gymnosporiae* (P. Henn.) Syd. (*a*) Mycelium; (*b*) spores.
8. *Phaeodimeriella capensis* Doidge n. sp. (*a*) Mycelium; (*b*) perithecium; (*c*) setae; (*d*) asci; (*e*) spores; (*f*) conidia.
9. *Parodiella Schimperi* P. Henn. (*e*) Perithecia on leaf; (*f*) ascus and spores.
9. *Parodiella congregata* Syd. (*a*) Perithecia on leaf (nat. size); (*b*) spores; (*c*) asci.
9. *Parodiella perisporioides* (Berk. & Curt.) Speg. (*d*) Asci and spores.
10. *Zukalia transvaalensis* Doidge n. sp. (*a*) Mycelium; (*b*) asci; (*c*) spores.

PLATE LIX.

11. *Meliola manca* Ell. & Mart. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) appendages of perithecia; (*d*) spores.
12. *Meliola natalensis* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) appendages of perithecium; (*d*) spores.
13. *Meliola conferta* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) cells of perithecium; (*d*) spores.
14. *Meliola Podocarpi* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) spores.

PLATE LX.

15. *Meliola speciosa* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) appendages of perithecium; (*d*) spores.
16. *Meliola torta* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial seta; (*d*) spores.
19. *Meliola cladotricha* Lev. (*a*) Mycelial seta; (*b*) spores.
20. *Meliola ditricha* (K. & Cke.) Doidge. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) spores.

PLATE LXI.

17. *Meliola ganglifera* Kalch. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
18. *Meliola peltata* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) tip of seta; (*c*) spores; (*d*) spore germinating.
25. *Meliola inermis* Kalch. & Cke. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) cells of perithecium; (*d*) spores.
26. *Meliola Bosciae* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) perithecial setae; (*d*) spores.

PLATE LXII.

21. *Meliola Hendeloti* Gaill. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) cells of perithecium; (*d*) spores.
22. *Meliola glabra* Berk. & Curt. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) cells of perithecium; (*d*) spores.
23. *Meliola Strophanthi* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) conidiophores; (*c*) cells of perithecium; (*d*) spores.
27. *Meliola capensis* (K. & Cke.) Theiss. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial seta; (*d*) spores.

PLATE LXIII.

FIG.

24. *Meliola Peglerae* Doidge. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) cells of perithecium; (*d*) spores.
28. *Meliola Toddaliae* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
29. *Meliola microspora* Pat. et Gaill. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
31. *Meliola Rhois* P. Henn. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial seta; (*d*) spores.

PLATE LXIV.

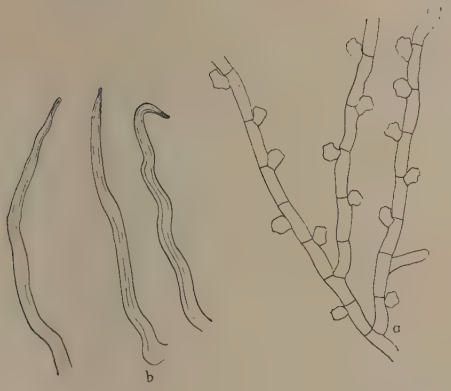
32. *Meliola microthecia* Thum. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
33. *Meliola sinuosa* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial seta; (*d*) spores.
35. *Meliola rigida* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
38. *Meliola Woodiana* Sacc. & Syd. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.

PLATE LXV.

30. *Meliola amphitricha* Fr. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial seta; (*d*) spores.
34. *Meliola polytricha* K. & Cke. (*a*) Mycelium with capitate hyphopodia; (*b*) mycelial seta; (*c*) spores.
39. *Meliola furcillata* Doidge n. sp. (*a*) Mycelium with capitate and mucronate hyphopodia; (*b*) mycelial setae; (*c*) cells of perithecium; (*d*) spores.
40. *Meliola varia* Doidge n. sp. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.

PLATE LXVI.

36. *Meliola falcata* Syd. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
37. *Meliola arcuata* Doidge. (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) mycelial setae; (*d*) spores.
41. *Meliola bifida* Cke. (*a*) Mycelium with capitate hyphopodia; (*b*) mycelial setae; (*c*) spores.
42. *Meliola leptidea* Syd. (*a*) Mycelium with capitate hyphopodia; (*b*) mycelial setae; (*c*) spores.



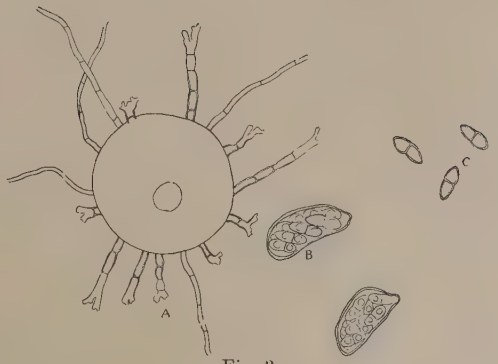


Fig. 3.

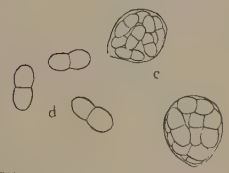
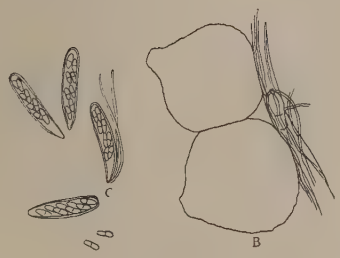


Fig 1.



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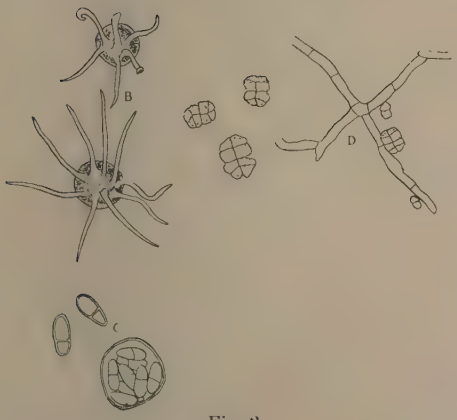

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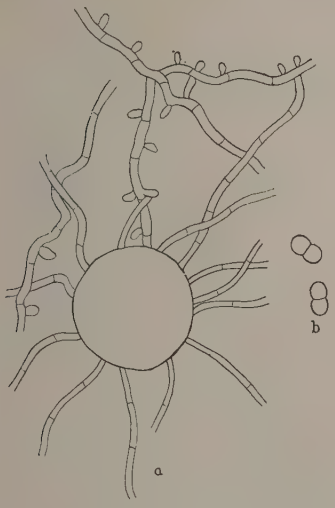

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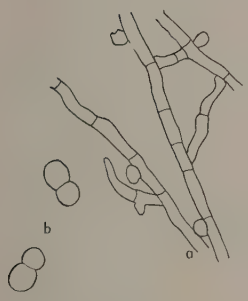

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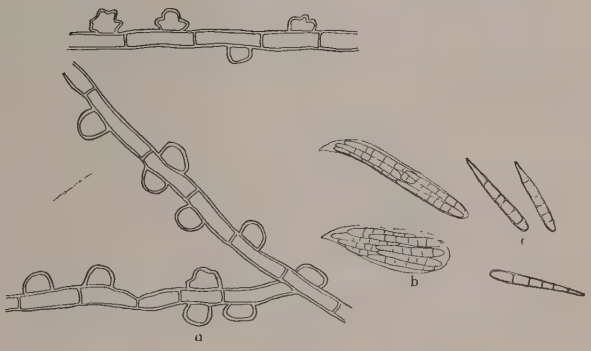

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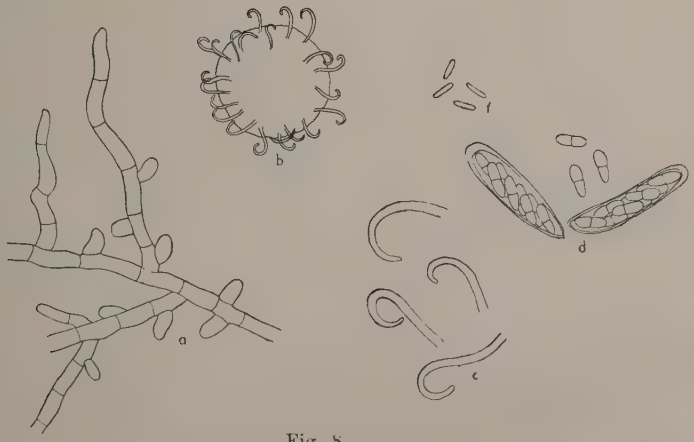

Fig. 8.

Adlard & West Newman.

Fig. 12.

Fig. 13.

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Fig. 16.

Fig. 20.

Fig. 15.

Fig. 19.

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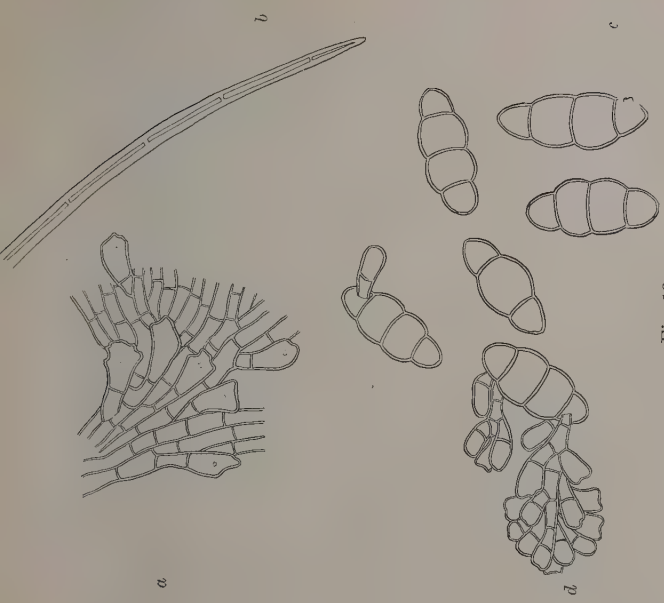

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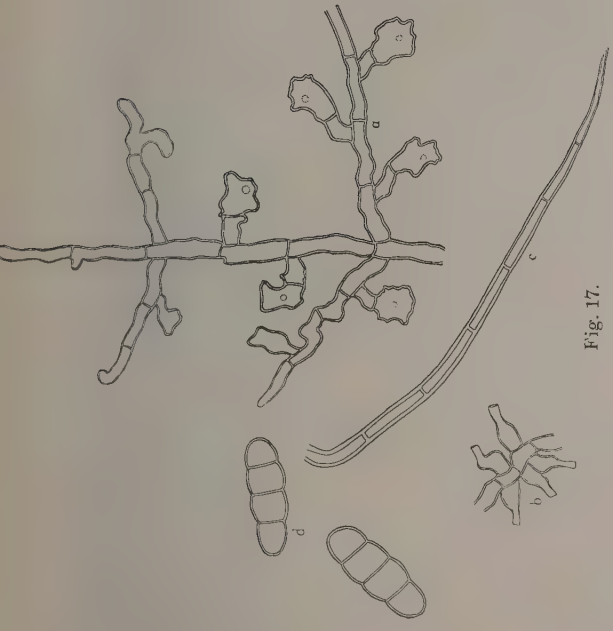

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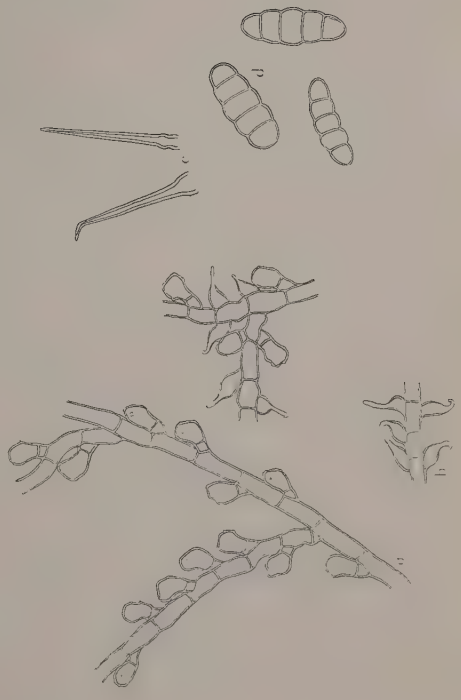

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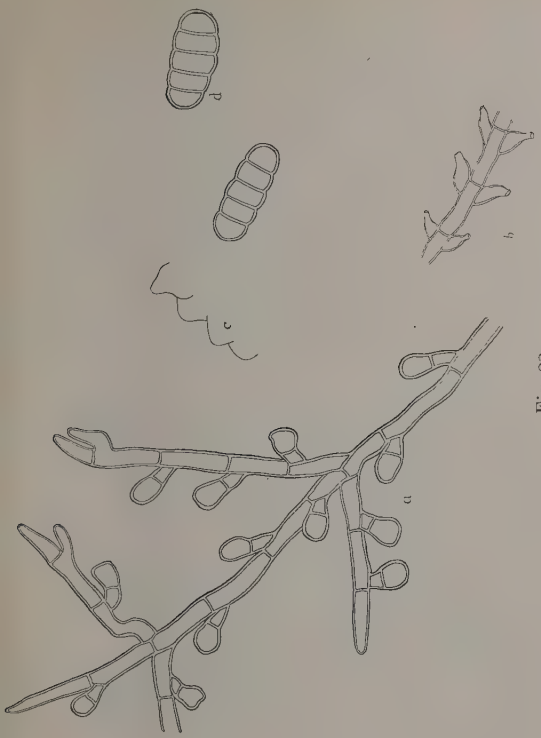

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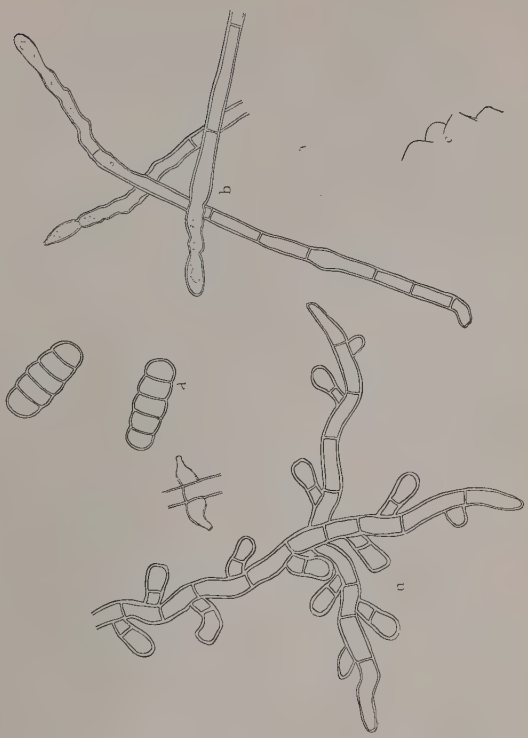

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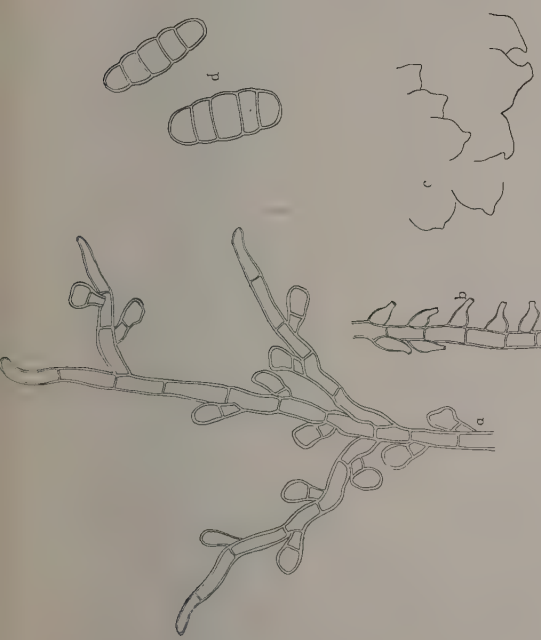

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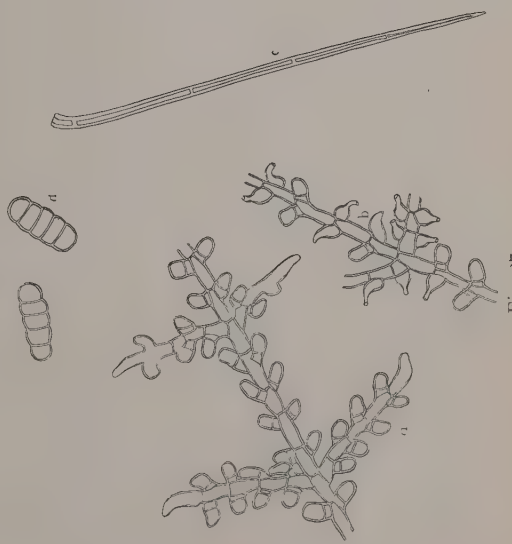
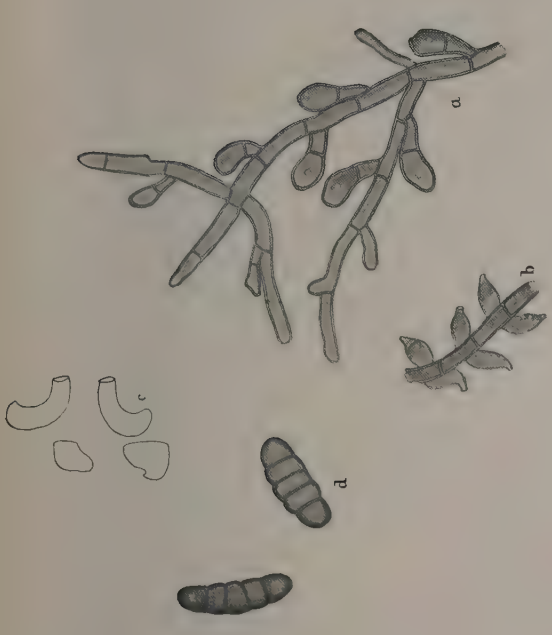


Fig. 27.

Adlard & West Newman.



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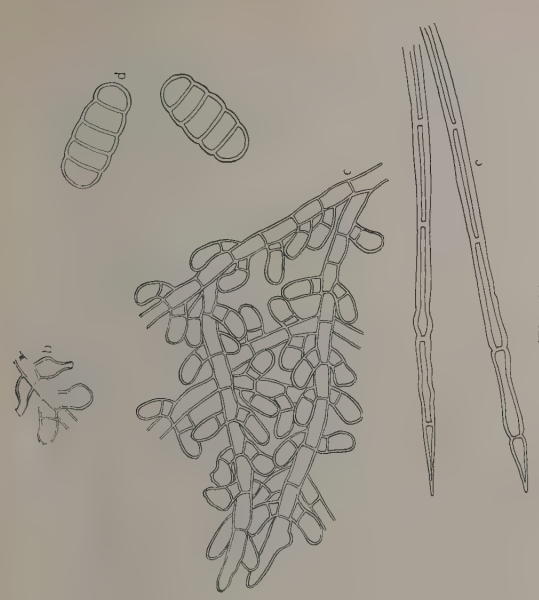

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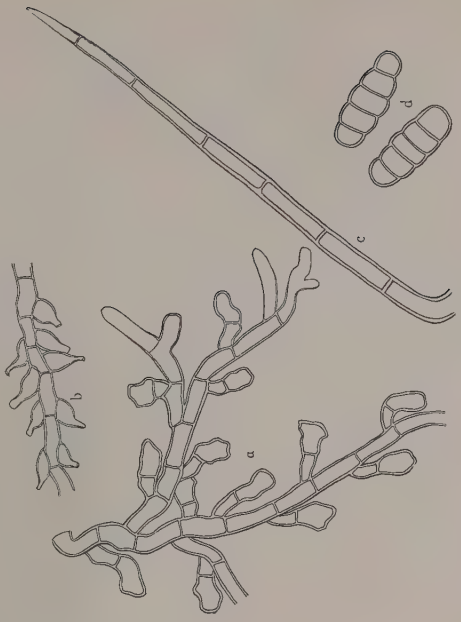

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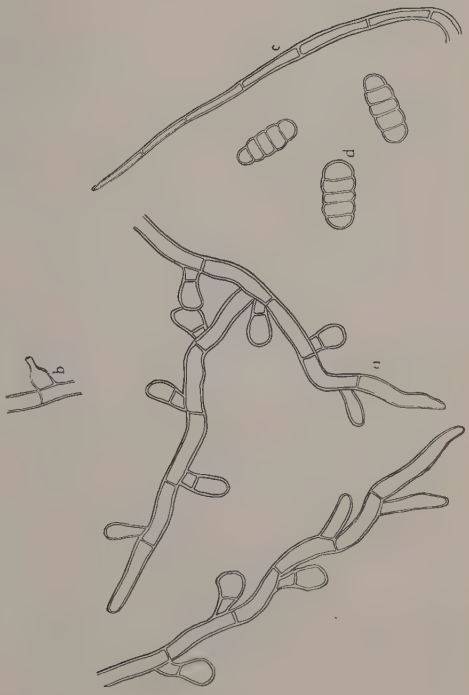

Fig. 29.

Fig. 35.

Fig. 32.

Fig. 33.

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Adlard & West Newman.

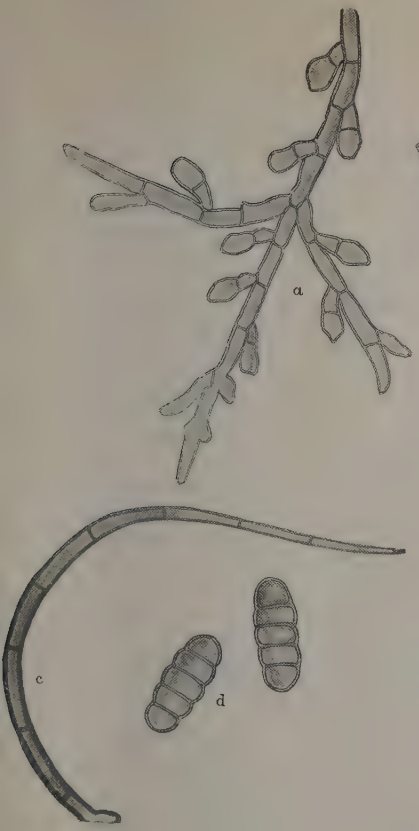
Fig. 34.

Fig. 30

Fig. 39.

Fig. 40.

Adlard & West Newman.



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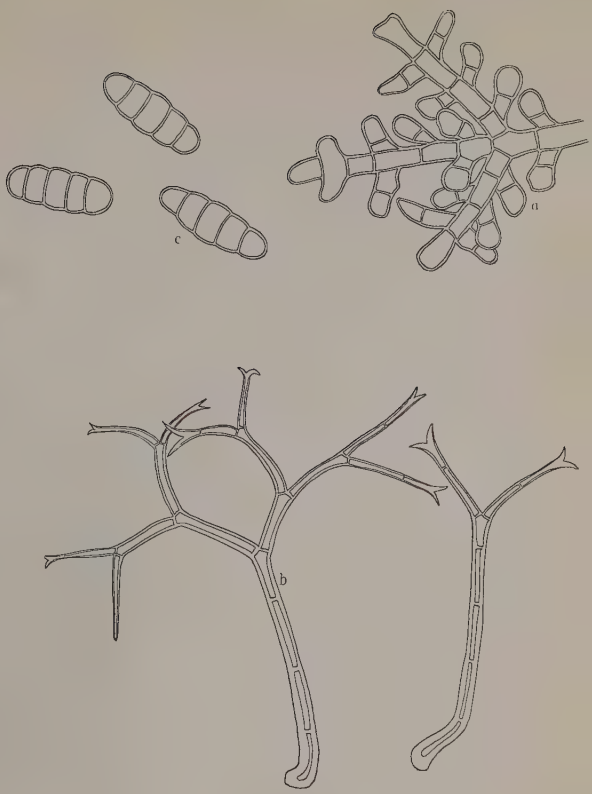

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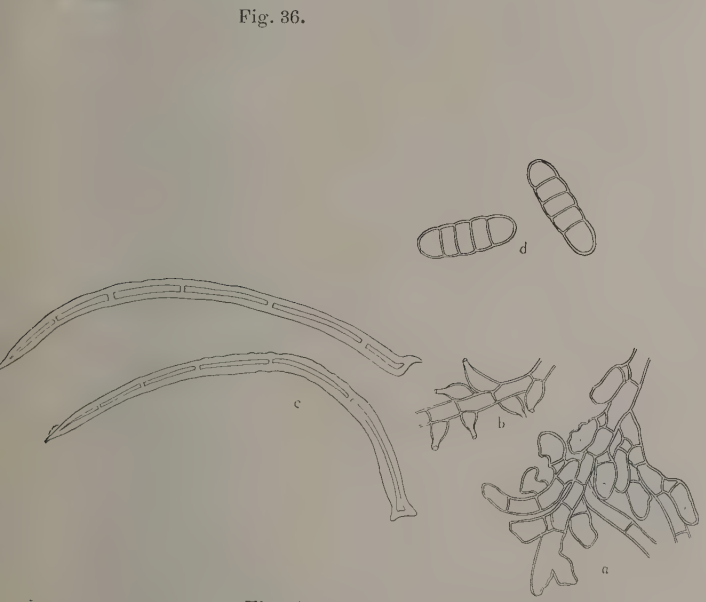

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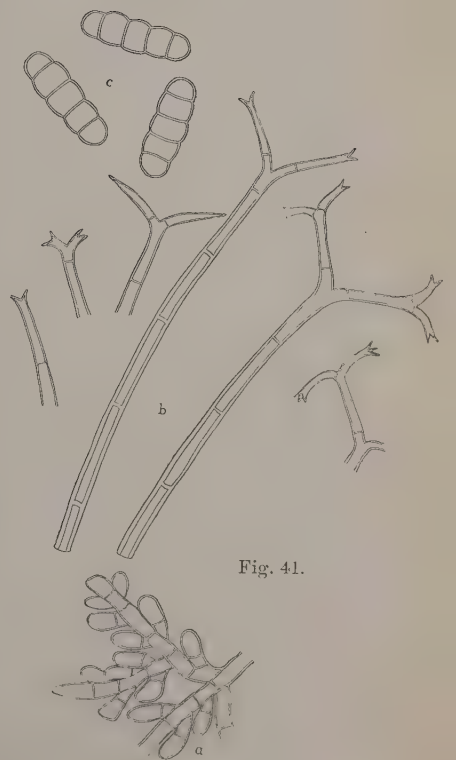

Fig. 41.

Adlard & West Newman.

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28 JUN. 1921
IMPERIAL BUREAU OF MYCOLOGY
FROM THE

TRANSACTIONS

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"SOUTH AFRICAN PHILOSOPHICAL II. [illegible]."

[illegible] L. Dobbie, M.A., D.Sc., F.L.S.

VOLUME VII.—PART 3.

1919.

CAPE TOWN:

PUBLISHED BY THE SOCIETY.

1919.

Issued March 27th, 1919.]

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SOUTH AFRICAN PERISPORIACEÆ.

II. Revisional Notes.

By Ethel M. Doidge, M.A., D.Sc., F.L.S.

(With three Text-figures.)

In working through a number of fresh collections of South African Perisporiaceæ, it has become evident that certain species described in my previous paper* on this group need revision. On p. 726 of the above-mentioned publication *Meliola torta* is described on the leaves of *Trichocladus crinitus*, and it is stated that there is another *Meliola* associated with this on the same leaves, with 4-septate spores and no setæ, but this was badly parasitised and could not be determined. In examining fresh collections of fungi on the same host, it has become evident that some confusion has arisen owing to the fact that there are at least four fungi (possibly more) on the same leaves.

One of these is an *Asterina*; of the others, in the first collection of *Trichocladus* the perithecia of *Meliola torta* were immature, and the spores of a fungus parasitic on the *Meliola*, and having similar perithecia, were described as those of *Meliola torta*. In later collections mature perithecia of *Meliola torta* were found with large 4-septate spores. It therefore becomes necessary to redescribe *Meliola torta*, and to describe the fungus parasitic on the two *Meliolas*. Mature non-parasitised material of the second species of *Meliola* was also found, and, as it appears to be a new species, I have named it *Meliola scabra*, on account of the frequently scabrous character of the capitate hyphopodia.

Meliola torta Doidge, char. emend.

Amphigena, maculas atras, tenues, 5–10 mm. diam. efficiens; hyphis tenuibus, 6–7 μ crassis, tortuosis, anastomosantibus, cellulis 25–36 μ long.; ramis irregularibus, plerumque unilateralibus; hyphopodiis capitatis stipitatis, tenuibus, stipitis nonnunquam septatis, cellula superiore 14–25 × 14–20 μ, diverse lobata, torta, apice obtusa v. convexa; hyphopodiis mucronatis ampullaceis, 20–36 μ long.; setis mycelicis non numerosis, sparsis, rectis, simplicibus, basi 10–11 μ cr., apice acutis; peritheciis paucis, sparsis, atris,

* 'Trans. Roy. Soc. of S.A.,' vol. v, pt. 6, 1917.

globulosis, rugulosis, *250–400 μ diam.*; ascis 2-sporis; sporidiis ellipsoideis, compressis, 4-septatis, *ad septa constrictis, cellula media majore, 54–67 × 20–22 μ × 17 μ.*

Hab. in foliis *Trichocladi criniti*, Izelini, Kingwilliamstown Dist., 8/6/15 (9064), Woodville Forest, George, 11/11/17 (10939).

Meliola scabra Doidge, n. sp.

Amphigena, maculas atras tenues 5–10 μ diam. efficiens; hyphis, 6–7 μ

Fig. 1.—*Meliola torta.* (*a*) Mycelium with capitate hyphopodia; (*b*) mucronate hyphopodia; (*c*) superficial cells of perithecium; (*d*) spores. [All figures drawn with the aid of camera lucida, with Zeiss objective D and No. 5 ocular.]

crassis, flexuosis: ramis plerumque oppositis; cellulis 24–30 μ long.; hyphopodiis capitatis alternis, breviter stipitatis, 23–30 μ long. cellula basali 6–7 μ long., cellula superiore ovata v. sub-uncinata, plerumque irregulariter sublobata, scabra; hyphopodiis mucronatis inter hyphopodia capitata interspersis, oppositis v. unilateralibus, ampullaceis, apice interdum curvatis; setis mycelicis nullis; peritheciis atris, carbonaceis, rugulosis, 200–250 μ diam.; ascis 2-sporis; sporidiis 4-septatis, utrinque rotundatis, vix ad septa constrictis, 36–40 × 14–17 μ.

Hab. in foliis *Trichocladi criniti*, Izelini, Kingwilliamstown Dist., 8/6/15, leg. Emmett (9064), Woodville Forest, George, 11/11/17, leg. E. M. Doidge (10939).

In foliis *Trichocladi elliptici*, 15/3/15, Tabankulu, Transkei, leg. G. Fraser (8891).

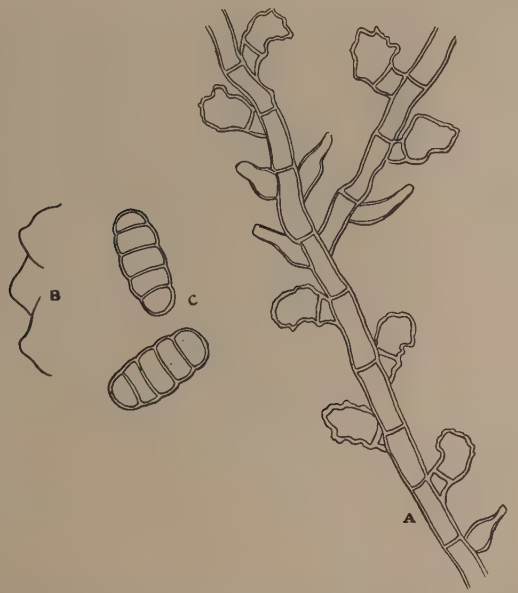

Fig. 2.—*Meliola scabra.* (*a*) Mycelium with both capitate and mucronate hyphopodia; (*b*) superficial cells of perithecium; (*c*) spores.

Perisporina melioliicola Doidge n. sp.

Hyphis ramosis, septatis, tenuibus, 3–3·5 μ cr., peritheciis atris, subglobosis, glabris, membranaceis, 160–180 μ diam.; ascis numerosis, paraphysatis, 8-sporis, ellipsoideis-oblongis, breviter pedicellatis, 60–66 × 18–20μ; paraphysibus simplicibus, filiformibus, hyalinis, ascos leniter superantibus; sporidiis distichis v. subtristichis, primum hyalinis, cellula superiore breviore, latiore, deinde, 3-septatis, clavatis, ad septa, vix constrictis, cellulis extremis valde minoribus, 25–30 × 7–11 μ.

Hab. in mycelio *Meliolae glabrae* et *Meliolae tortae* in foliis *Trichocladi criniti*, Izelini Forest, Kingwilliamstown, 14/6/15 (9064).

Another point to which I wish to draw attention is the nomenclature of the *Meliola* commonly found on *Rubus* and also recorded on *Pygeum africanum*. The early collections of this fungus were submitted to Sydow

for determination, and he, following Gaillard,* named the fungus *Meliola manca*. In a recent publication † F. L. Stevens writes as follows:

"In 'Le Genre Meliola,' Gaillard writes under *Meliola manca* the three species *M. manca*, *M. sanguinea*, and *M. puiggarii*, giving a new description of *M. manca*. This new description mentions larvaeform perithecial appendages. The original description of *M. manca* by Ellis and Martin mentions no such appendages, but does specifically state that there are no perithecial appendages. My own material of the two collections is ample. I have studied it carefully, also a specimen of the Heller collection, and a specimen collected by Martin and distributed by Ellis as N.A.F. No 1292, all of these upon the same host (*Myrica cerifera* L.). These specimens all agree perfectly, and agree with the original description. They do not have larvaeform perithecial appendages, and therefore do not conform with the description as given by Gaillard.

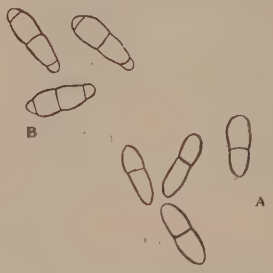

Fig. 3.—*Perisporina melioliicola*. (*a*) Immature and (*b*) mature spores.

"The specimens of *Meliola* which have been found on *Rubus* agree well with the description of *Meliola puiggarii*. They have abundant larvaeform appendages, and cannot be placed under *M. manca*. Moreover, both the general characters of the mycelium and the capitate hyphopodia separate the forms on *Rubus* from those on *Myrica*, the hyphopodia on *Rubus* being much larger and more irregular in shape. I am forced, therefore, to regard the description given by Gaillard for *M. manca* as erroneous, and that of Ellis and Martin as correct, and to recognise *M. puiggarii* on *Rubus* as an entirely different species."

In view of the evidence thus clearly set forth, and after examining specimens of both species kindly sent me by Mr. Stevens, I am driven to conclude that the South African specimens on *Rosaceae* which have abundant larvaeform perithecial appendages should be named *M. puiggarii*. The South African specimens agree with the Porto Rico specimens of *M. puiggarii*, the only difference being that the larvaeform perithecial appendages are, if any-

* 'Le Genre Meliola,' p. 37.

† "The genus *Meliola* in Porto Rico," 'Illinois Biol. Monographs,' vol. ii, No. 4.

thing, less numerous and rather shorter on the South African specimens. I have also to record this fungus on a number of new hosts in addition to those already mentioned, as follows:

Meliola puiggarii Speg.

On leaves of *Rubus rigidus*, Winter's Kloof, Natal, 17/6/11, E. M. Doidge (1574); Woodbush, Zoutpansberg Dist., 5/8/11, E. M. Doidge (1771); Cramond, Natal, 3/6/12, I. B. Pole Evans (2405); Knysna, C.P., 3/6/12, P. J. Pienaar (2425).

On leaves of *Rubus pinnatus*, Buccleuch, Natal, 20/4/16, J. M. Sim (10150).

On leaves of *Pygeum africanum*, Woodbush, Zoutpansberg, 3/8/11, E. M. Doidge (1761).

On leaves of *Cliffortia strobilifera*, van Staden's Pass, 13/11/17, E. M. Doidge (10859).

On leaves of *Cliffortia ferruginea*, van Staden's Pass, 13/11/17, E. M. Doidge (10861).

On leaves of *Leucosidea sericea*, Nottingham Road, Natal, 8/4/11, P. v. d. Bijl (Natal Herbarium, No. 596).

I wish also to call attention to an error in the Explanation of Plates which was overlooked in correcting the proofs. Plate LXIII, fig. 24, is named *Meliola Peglerae;* this figure illustrates *M. inermis;* and the fig. 25, Plate LXI, which is called *M. inermis*, should be *M. Peglerae.*

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SOUTH AFRICAN PERISPORIACEAE.

By Ethel M. Doidge.

(With Plate IV.)

(Read May 15, 1918.)

III. Notes on Four Species of *Meliola* Hitherto Unrecorded from South Africa.

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Sacc. Syll. Supp. Univ. i, p. 425.
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Mostly hypophyllous, forming round or irregular spots 1–4 mm. diam., often confluent and covering a great part of the leaf surface. Hyphae brown, 5–7 μ thick; composed of cells 25–30 μ long; branches opposite; capitate hyphopodia opposite, alternate or unilateral, 14–16 × 7–10 μ, briefly stipitate, terminal cell ovoid or globular; mucronate hyphopodia interspersed with the capitate hyphopodia, opposite, narrow-ampulliform, 12–15 μ long. Mycelial setae fairly numerous, incurved and bent at right angles at the base or at some other point in their length, becoming insensibly narrower towards the translucent apex, 150–300 × 5–10 μ. Perithecia in small groups in the centre of the spot, globular, then depressed, black, minutely verrucose, 150–220 μ diam. Asci 2-spored. Spores 4-septate, cylindrical, straight or slightly curved, slightly constricted at the septa, and slightly attenuated towards the rounded extremities, 30–38 × 12–15 μ.

On *Indigofera* sp., Buccleuch, Natal, 23/3/16, E. M. Doidge (9703).

On *Baphia racemosa*, Sea View, Durban, 1/10/17, P. v. d. Bijil (Natal Herbarium No. 783) (11354).

In both these specimens the majority of the spores fall within the dimensions given above, but a few are longer, up to 42 μ.

Meliola bicornis Wint.

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Colonies black round-irregular, scattered or confluent, sometimes up to 8 mm. diam. Hyphae slender, 6–7 μ, spreading, laxly branched, flexuose, somewhat torulose. Capitate hyphopodia opposite, alternate or unilateral, small 12–15 μ × 7–10 μ; basal cell very short, 3–5 μ, enlarged at the base, terminal cell globular. Mucronate hyphopodia interspersed with the capitate hyphopodia, usually opposite, ampulliform, drawn out into rather a long neck. Mycelial setae rather numerous, slender, brown, translucent, with numerous septa, divided at the apex into 2 (occasionally 3) simple or forked acute branches. Perithecia scattered over the whole colony, globular, then depressed, scabrous, 120–160 μ diam. Asci ellipsoid with a very short foot, with 2–3 or 4 spores. Spores 4-septate, slightly constricted at septa, brown, broadly rounded at both ends, 37–45 × 12–15 μ.

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Gaillard, Le Genre Meliola, p. 101

Spots orbicular, often confluent, 1–15 mm. diam., black, with an irregular margin. Mycelium brown, branching, branches opposite, anastomosing. Hyphae somewhat sinuous, about 10 μ thick, cells 24–28 μ long. Capitate hyphopodia alternate, stipitate, basal cell 10–25 μ long, non-septate in younger parts of mycelium and about 10 μ long, in central parts of colony often pluricellular and up to 25 μ long; terminal cell globular to ovoid, often bent laterally and more or less lobed, 16–20 × 10–11 μ. Mucronate hyphopodia fairly numerous, on separate branches, opposite, ampulliform, 17–20 × 8–10 μ. Mycelial setae very numerous, straight, erect, opaque, black, 400–500 μ long, about 10 μ thick at base, tapering slightly towards apex; apex sometimes simple, more often divided into 2–3 simple or bifid branches; more rarely there are 4 or 5 unilateral branches. Perithecia fairly numerous in centre of colony, globular, than depressed, 180–250 μ diam., surface minutely verrucose. Asci ovoid, 2–4 spored, about 54–56 × 30–35 μ. Spores 4-septate, slightly constricted at the septa, elliptic, rounded at both ends, 48–55 × 20–22 μ.

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Annales Mycologici, Bd. ix, 1911, p. 381.

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A typo differt, hyphopodiis capitatis, peritheciis et sporidiis majoribus.

EXPLANATION OF PLATE IV.

[All drawings made with help of camera lucida, with Zeiss objective DD and ocular No. 5.]

FIG.

1. *Meliola malacotricha.* (*a*) Mycelium showing capitate and mucronate hyphopodia; (*b*) spores.
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Botanical Laboratories of the Union
of South Africa, Pretoria.

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(With Plate IV.)

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Botanical Laboratories of the Union
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Fig. 1.

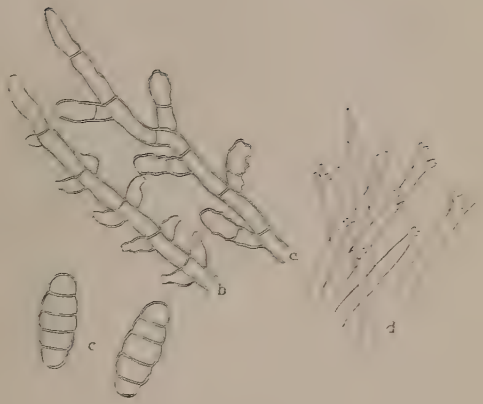

Fig. 3.

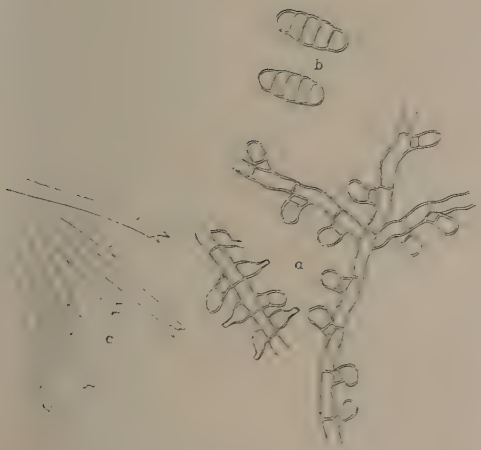

Fig. 2.

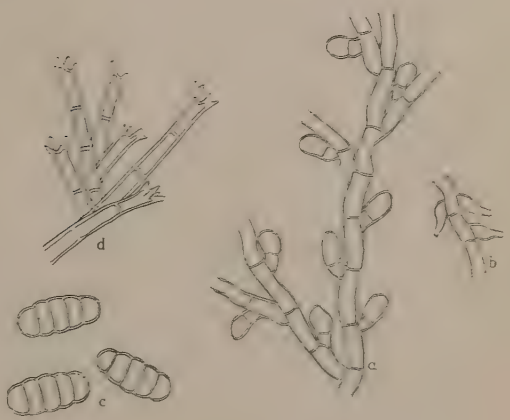

Fig. 4.

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SOUTH AFRICAN PERISPORIACEAE.

By Ethel M. Doidge, M.A., D.Sc., F.L.S.

(With Plates V and VI.)

(Read June 19, 1918.)

IV. New Species from the Coast Districts.

Of the nine new species of fungi described below, six belong to the genus *Meliola*, of which forty-two species have now been recorded as occurring in South Africa.

Meliola Evansii is closely related to *M. ganglifera*, from which it differs chiefly in the size of the spores and in the size and form of the hyphopodia.

The section characterised by the presence of perithecial appendages is a comparatively small one, and up to the present only one species has been described—*M. Bosciae*, from the Natal coast. Three more species belonging to the section have now been collected, and these may be distinguished by the following characters:

Section II, B: Spores 4-septate, setae perithecial.

a. Spores less than 40 μ long.

x. Setae straight, *M. Kentaniensis*.

xx. Setae uncinate, *M. claviculata*.

b. Spores 40–50 μ long.

x. Spores 10–14 μ broad, *M. Bosciae*.

xx. Spores 15–17 μ broad, *M. comata*.

The two remaining species belong to the large section with 4-septate spores and simple mycelial setae.

M. Loxostylidis is closely allied to *M. Rhois*, from which it differs in the form and number of the mycelial setae. *M. Cryptocaryae* comes nearest to *M. microthecia*, but is distinguished from that species by the larger size of he perithecia and by other minor differences.

Meliola comata Doidge n. sp.

Amphigena, plerumque epiphylla, maculas atras, 1–3 mm. diam. efficiens; hyphis fuscis, subflexuosis, 7–8 μ crassis; ramis plerumque oppositis; hyphopodiis capitatis alternis, stipitatis, 18–25 × 9–10 μ, cellula basali 4–6 μ longa, prope hypham attenuata, cellula superiore ovata v. angulata; hyphopodiis

mucronatis oppositis v. unilateralibus, inter hyphopodias capitatas interpersis, piriformibus v. ampullaceis, saepe curvatis, 18–20 × 6–7 μ; setis mycelicis nullis; setis perithecialibus numerosis (circ. 20), 100–150 μ long., basi brunneis, 6 μ crassis, ad. apicem pellucidem, 3 μ cr. attenuatis; plerumque plus minusve incurvatis, et nonnumquam uncinatis, non-septatis; peritheciis gregariis, atris, globulosis, carbonaceis 200–240 μ diam., verrucosis; ascis bisporis, evanescentibus; sporidiis cylindraceis brunneis, 4-septatis, vix constrictis, leniter utrinque attenuatis, 40–43 × 15–17 μ.

In foliis ? *Ipomeae* sp. Woodville Forest, George, 15/11/17, E. M. Doidge (11020).

This fungus is very much overgrown by a number of parasites, chiefly *Dimerium intermedium*, *Speggazinia* sp., and an ascomycete with thyriothecia of the Microthyriaceae type which is frequently found parasitic on various species of *Meliola*, but up to the present alwavs in an immature condition.

Meliola Cryptocaryae Doidge n. sp.

Hypophylla, maculas rotundas v. enormes, 4–10 μ diam. efficiens; hyphis undulatis, 6–7 μ crassis; ramis oppositis v. irregularibus, cellulis 20–30 μ longis; hyphopodiis capitatis alternis, breviter stipitatis, 26–33 × 8–10 μ, tenuibus, undulatis, uncinatis v. sub-lobatis, cellula basali 6–7 μ long.; hyphopodiis mucronatis oppositis pallidioribus, ampullaceis, curvatis, 15–16 μ long.; setis mycelicis paucis, sparsis, sed circum perithecia numerosis, rectis v. sub-flexuosis, basim abrupte geniculatis, 400–500 μ longis, opacis, 6–7 μ crassis, paulatim ab imis ad apicem pellucidem, 3 μ cr. attenuatis; peritheciis gregariis, atris, globosis, verrucosis, 240–260 μ diam.; ascis bisporis evanescentibus; sporidiis 4-septatis cylindraceis, leniter constrictis, utrinque subattenuatis rotundatis que, 50–57 × 18–20 μ.

In foliis *Cryptocaryae latifoliae*, Umbilo, Natal, 29/10/16, leg. P. van der Bijl (N. H. 517) (11016); Stella Bush, Durban, January, 1917, P. v. d. Bijl (N. H. 518).

In foliis *Cryptocaryae Woodii*, Mayville, Natal, 22/7/15, leg. J. Medley Wood (9025).

The mycelium is more undulate, and the setae more wavy in the collections on *C. latifolia* than in those on *C. Woodii*. This is probably to be attributed to the tomentose under-surface of the leaves in the former species. On *C. Woodii* the setae are as a rule quite straight.

Meliola Evansii Doidge n. sp.

Amphigena, plerumque epiphylla, maculas atras rotundas, 3–5 mm. diam. efficiens: mycelio conferto, copiose ramoso, anastomosante; hyphis brunneis 6–8 μ diam.; cellulis circ. 20 μ long.; ramis alternis, ad articulas cum hyphis abrupte attenuatis; hyphopodiis capitatis alternis, stipitatis, 26–36 × 13–16 μ, cellula basali 8–10 μ long.; ad articulum cum hypha

abrupte attenuata, cellula superiore cylindrica, uncinata, v. ovata, irregulariter lobulata; hyphopodiis mucronatis pallidioribus, haud numerosis, piriformibus, ca. 20 × 7 μ; setis mycelicis sparsis, satis numerosis, rectis, simplicibus, opacis 300–400 μ long., 7–8 μ cr., ad apicem pellucidem paulatim attenuatis; peritheciis sparsis, haud numerosis, atris, globosis, carbonaceis, verrucosis, 200–240 μ diam.; ascis bisporis, evanescentibus; sporidiis brunneis, 3-septatis, constrictis, sub-curvatis, cellulis mediis majoribus, 48–54 × 18–20 μ.

In foliis *Celastrineae* cujusdam, Mossel Bay, 22/7/15, leg. I. B. Pole Evans (9067), in foliis *Mystroxylon euclaeformis*, Qudeni Forest, Zululand, leg. G. W. Davies (11237); Woodbush, Zoutpansberg Dist., February, 1914, leg. A. J. O'Connor (Economic Herb. No. 10222).

M. gangliferae affinis.

Meliola Kentaniensis Doidge n. sp.

Amphigena, plerumque epiphylla, maculas atras 3–5 mm. diam. efficiens; hyphis brunneis, subflexuosis, 5–7 μ crassis, cellulis 18–23 μ long.; ramis oppositis; hyphopodiis capitatis alternis v. unilateralibus, 15–20 × 8–10 μ, brevissime stipitatis, cellula basali circ. 3 μ long., et 6 μ cr.; cellula superiore, irregularis, plerumque ovata sed plus minusve angulata tuberculataque; hyphopodiis mucronatis non numerosis, inter hyphopodias capitatas interspersis, ampullaceis, collo longo curvato, 15–17 × 6–8 μ; setis mycelicis nullis; setis perithecialibus 5–12, rectis v. leniter flexuosis, pellucidis, leniter attenuatis ad apicem obtusum, basim sub-bulbosis, septatis, 60–90 × 5–7 μ; peritheciis atris, carbonaceis, globosis, verrucosis, 160–200 μ diam.; ascis evanescentibus; sporidiis 4-septatis, brunneis, cylindraceis, utrinque rotundatis, leniter constrictis, 35–38 × 14–16 μ.

In foliis ? *Rhus* sp. Kentani, C.P., 6/9/15, leg. A. Pegler (Pegler No. 2354) (9130).

Meliola claviculata Doidge n. sp.

Amphigena, maculas minutas, atras, creberrimas efficiens, superficiem foliae tecta; hyphis brunneis, undulatis, 6–7 μ crassis; cellulis brevibus, 12–15 μ long.; hyphopodiis capitatis alternis, breviter stipitatis, 17–20 × 8–10 μ, saepe ad hyphas appressis, cellula basali 3–5 μ long.; cellula superiore subovata, plerumque apice complanata; hyphopodiis mucronatis oppositis, ampullaceis, curvatis 14–20 × 6–7 μ; setis mycelicis nullis; setis perithecialibus 3–7, omnino pellucidis, non-septatis, 100–120 × 6–7 μ, apice haud attenuatis, uncinatis v. contortis; peritheciis gregariis, atris, globulosis, verrucosis, 206–230 μ diam.; ascis bisporis, evanescentibus; sporidiis 4-septatis, cylindraceis, loculis aliquanto irregularibus, leniter constrictis, 36–40 × 15–18 μ.

In foliis *Oncoba* sp. Quelimane, Portuguese East Africa, 8/9/13, leg. I. B. Pole Evans (7388).

Meliola Loxostylidis Doidge n. sp.

Hypophylla, maculas atras 3–4 μ diam. efficiens; hyphis tortuosis, fuscis, torulosis, 5–9 μ crassis; ramis irregularibus, anastomosantibus; hyphopodiis capitatis alternis v. plerumque unilateralibus, stipitatis, 20–30 × 10–17 μ, cellula basali rectis v. curvatis, 10–17 × 5–7 μ, cellula superiore ovata, uncinata v. triangularis; hyphopodiis mucronatis non numerosis, oppositis atternis v. unilateralibus, pyriformibus, 13–17 × 6–7 μ; setis mycelicis raris, simplicibus, rectis v. basim abrupte geniculatis, omnino pellucidis, haud apice acuto attenuatis, nonnunquam ad septa constrictis, 140–240 μ long., 6–7 μ crassis; peritheciis non numerosis, sparsis, atris, globosis, carbonaceis, verrucosis, 200–240 μ diam.; ascis 2–4 sporis, evanescentibus; sporidiis 4-septatis, cylindraceis, compressis, vix constrictis, utrinque rotundatis 37–47 × 17–20 μ.

In foliis *Loxostylidis alatae*, van Stadens Pass, C.P., 13/11/17, leg. E. M. Doidge (10921).

In foliis fruticis incognitis, 22/7/15, Mayville, Natal, leg. J. Medley Wood (9026).

Zukalia parenchymatica Doidge n. sp.

Epiphylla, effusa, pelliculam tenuem, fuscam efficiente mycelio pallidiore, fuliginoso, hyphis 3·5–5 μ cr., copiose ramosis anastomosantibus; cellulis 10–15 μ long.; hyphis ad septa constrictis, pelliculam plecten chymaticam, praesertim prope perithecia efficientibus; peritheciis globuloso-depressis, deinde pulvinatis; sparsis, parenchymaticis, membranaceis, 300–400 μ diam.; ascis numerosis paraphysatis, ellipsoides-ovatis breviter pedicellatis, 50–60 × 20–30 μ; paraphysibus filiformis, ascos parum superantibus; sporidiis oblique distichis v. conglobatis hyalinis v. flavescentibus, 5–7 septatis, ellipsoideis nonnumquam sub-curvatis, ad septa vix constrictis, 30–40 × 8–10 μ.

In foliis *Xymalos monosporae* Kentani, 3/3/15, leg. A. Pegler (Pegler No. 1999) (8864).

Zukalia Woodiana Doidge n. sp.

Hypophylla, maculas ferrugineae 10–15 μ diam. efficiens; mycelio pallidiore, fuligineo; hyphis tenuibus, circ. 3 μ crassis, copiose ramosis, anastomosantibus; hyphopodiis nullis; peritheciis numerosis, atris, sub-globosis, carbonaceis, verrucosis, pseudo-ostiolatis 95–115 μ diam.; ascis 8-sporis, aparaphysatis, ellipsoideis v. ovatis, breviter pedicellatis, apice tunicatis 30–40 × 13–17 μ; sporidiis hyalinis-flavescentibus, distichis v. parallelis, linearis-ellipsoideis v. sub-clavatis; primo sub-equaliter 1-septatis, deinde 3–5 septatis, medio facile divisis, 18–24 × 4–5 μ.

In foliis *Celastri albati*, 20/5/15, Winkle Spruit, Natal, leg. E. M. Doidge (9008).

In foliis *Celastrineae* cujusdam, 22/7/15, Durban, Natal, leg. J. Medley Wood (9061).

Phaeodimeriella asterinicola Doidge n. sp.

Peritheciis in mycelio *Asterinae* quaedam parasiticis, hyphis parcissime 3–3·5 μ cr. evolutis, aggregatis, ovatis usque globosis, atris, membranaceis, superne angustatis papilliformiter productis et poro pertusis, 70–100 μ diam., setis 4–10 coronatis; setis 40–50 μ long., brunneis, apice obtusis et subuncinatis v. curvatis; ascis fasciculatis, numerosis, paraphysatis, clavato-cylindraceis, sessilibus, 8-sporis, 40–45 × 10–12 μ; sporidiis distichis, subfusiformibus, 1-septatis haud v. vix constrictis, loculo supero plerumque latiore, 13–14 × 3·5–5 μ.

Parasitic in *Asterina* quadam ad folia *Tylophorae Flanagani*, 14/8/15, Brander's High Forest, Victoria East C.P., leg. P. v. d. Bijl (9458).

EXPLANATION OF PLATES V AND VI.

[All drawings were made with the aid of the camera lucida with a Zeiss objective DD and No. 5 ocular.]

FIG.

1. *Meliola comata.* (A) Mycelium with capitate and mucronate hyphopodia: (B) perithecial setae; (C) spores; (D) superficial cells of the perithecium.
2. *M. Cryptocaryae.* (A) Mycelium with capitate hyphopodia; (B) mycelium with mucronate hyphopodia; (C) spores.
3. *M. Evansii.* (A) Mycelium with capitate hyphopodia; (B) mucronate hyphopodium; (C) spores; (D) superficial cells of perithecium.
4. *M. Kentaniensis.* (A) Mycelium with capitate hyphopodia; (B) mucronate hyphopodia; (C) spores; (D) perithecial setae.
5. *M. claviculata.* (A) Mycelium with capitate hyphopodia; (B) with both capitate and mucronate hyphopodia; (C) spores; (D) superficial cells of perithecium; (E) perithecial setae.
6. *Meliola Lozostylidis.* (A) Mycelium with capitate hyphopodia; (B) with mucronate hyphopodia; (C) spores; (D) superficial cells of perithecium.
7. (A) Spores of *Zukalia parenchymatica*; (B) spores of *Z. Woodiana*; (C) spores and (D) mycelial setae of *Phaeodimeriella asterinicola.*

BOTANICAL LABORATORIES OF THE UNION
OF SOUTH AFRICA, PRETORIA.

Fig. 1.

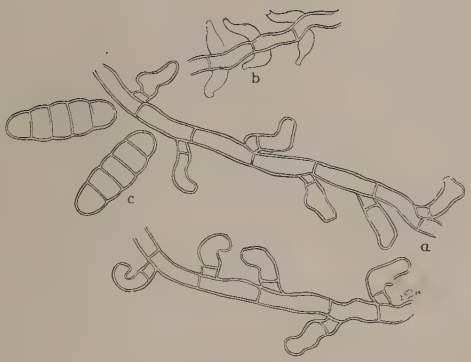

Fig. 2.

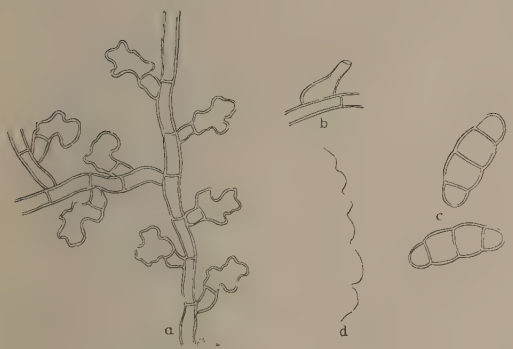

Fig. 3.

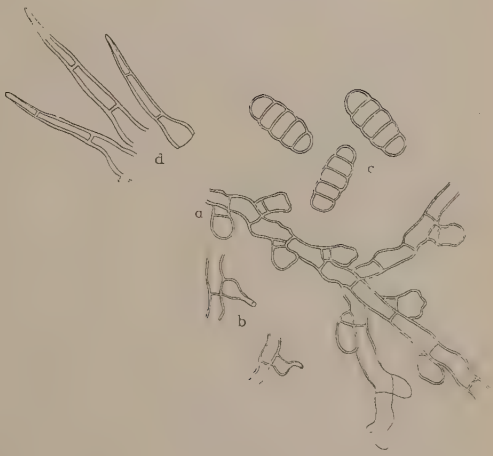

Fig. 4.

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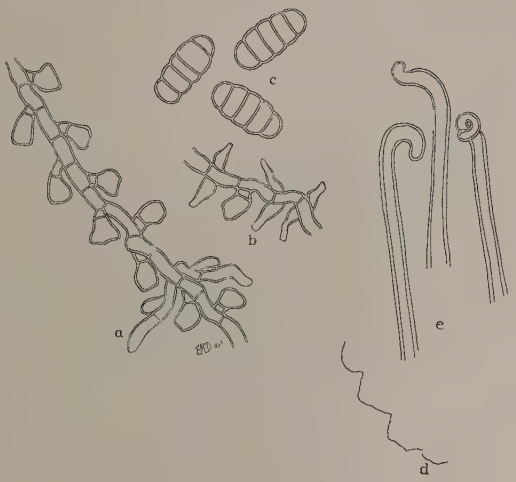

Fig. 5.

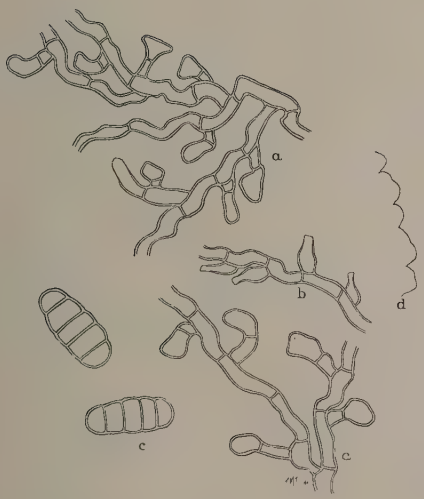

Fig. 6.

Fig. 7.

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SOUTH AFRICAN PERISPORIACEAE.

By Ethel M. Doidge.

(With Plates VII and VIII.)

V. Notes on an Interesting Collection from Natal.

During July of this year an interesting collection of leaf fungi was made at three localities in Natal. The largest number of specimens was obtained at Buccleuch, near Cramond, on the 16th and 17th; smaller collections were made at Zwartkop on the 19th and at Hilton Road on the 21st of that month. A large proportion of the fungi belong to the genus *Meliola*, and include a number of undescribed species, some of which have been collected on previous occasions in an immature condition, or so overgrown with parasites as to make a careful study impossible. A number of species previously recorded have also been collected on different hosts.

Meliola amphitricha, Fr.

On *Olea laurifolia* Buccleuch (11557).

On *Plectronia guienzii* Buccleuch (1576).

This species was collected on *Olea laurifolia* in the Woodbush and occurs on a variety of hosts belonging to the *Rubiaceae*, *Oleaceae*, and *Sapindaceae*. It has not been previously recorded on a *Plectronia*, the species most commonly found on this host being *Meliola falcata* Syd.

Meliola (Fig. 1).

On leaves of an unknown shrub, probably belonging to the *Myrtaceae*, Zwartkop (11594). This fungus is chiefly epiphyllous and forms small, sooty black, crustaceous growths which are easily separated from the leaf surface. The leaf tissues covered by the mycelium are brown and discoloured.

Meliola atra n. sp.

Amphigena, plerumque epiphylla, maculas atras, crustaceas, 3–4 μ diam. efficiens; hyphis fuscis, 7–10 μ crassis, cellulis brevis, 12–16 μ long., interdum ad septa constrictis; ramis plerumque oppositis; hyphopodiis capitatis alternis vel unilateralibus, breviter stipitatis, 20–27 × 16–20 μ, cellula superiore magna, inaequaliter lobulata; hyphopodiis mucronatis non numerosis, oppositis v. unilateralibus, pyriformibus v. sub-conicis, 10–13

× 6–7 μ. Peritheciis non numerosis, atris, carbonaceis, 200 μ diam. (non maturis); ascis non visis; sporidiis late ellipsoideis, 4-septatis, vix constrictis, utrinque rotundatis, 50–54 × 20–24 μ.

In foliis fruticis ignotis, Zwartkop, 19/7/18, leg. Doidge (M. H. No. 11594).

Meliola Cryptocaryae Doidge.

On *Cryptocarya Woodii* Zwartkop (11603.)

Meliola sp. (Fig. 2).

On the same leaves as *Meliola atra*. There is also on these leaves a fungus belonging to the *Trichopeltaceae* and one belonging to the *Hemisphaeriaceae*, both immature, and a species of *Asterina*. The general habit of the *Meliola* is very similar to that of *Meliola Helleri* Earle, which occurs in Porto Rico, but the setae are not forked as called for in the description of *M. Helleri* and the spores and hyphopodia differ somewhat in size.

Meliola cylindripoda n. sp.

Amphigena, plerumque hypophylla, pelliculas tenues subindefinitas, nigras, 3–6 μ diam., formans, saepe plus minusve confluens; mycelio intertexta, pallide fusco; hyphis 6–7 μ crassis, irregulariter undulatis, cellulis 20–27 μ long., ramis oppositis; hyphopodiis capitatis alternis v. unilateralibus, breviter stipitatis, 12–16 × 6–9 μ; cellula superiore cylindracea: hyphopodiis mucronatis paucis, oppositis v. sparsis, ampullaceis v. pyriformibus, 16 × 6–7 μ; setis mycelicis parcis, simplicibus, rectis v. flexuosis, 300–500 μ long, basi 6–7 μ crassis, opacis, ad apicem pallidiorem paulatim attenuatis; peritheciis sparsis, globosis, minute verrucosis, 200–240 μ diam.; ascis evanidis; sporidiis 40–44 × 15–17 μ, cylindraceis, atro-fuscis, utrinque rotundatis 4-septatis, leniter constrictis.

In foliis fruticis ignotis, Zwartkop, 19/7/18, leg. Doidge (M. H. 11596).

Meliola ditricha K. & Cke. (Doidge).

On *Olea laurifolia* Buccleuch (11615) and on *Gymnosporia* sp. Buccleuch (11572). This species was described from material collected by Medley Wood in 1876 ('Trans. Roy. Soc. S.A.,' vol. v, pt. 6, p. 728) on *Celastrus* sp. on which the perithecia were immature. Recent collections show abundant mature perithecia, they are 280–320 μ diam. and have conical chitinous appendages about 30–40 μ long; these are more opaque than is usual in these perithecial appendages. The form on *Olea* is more effuse and the hyphopodia somewhat larger (33–40 × 13–10 μ) than that on *Celastrus*. On *Olea* the fungus is usually heavily parasitised and does not often form perithecia. *Meliola ditricha* has also been collected on *Olea laurifolia* at Tabankulu, Transkei, 15/3/15, by G. Fraser (M. H. 8888), and on *Pleurostylia capensis*, van Stadens Pass, 13/11/17, leg. E. M. Doidge (10883).

Meliola sp. (Fig. 3).

On *Excoecaria caffra*, Buccleuch; forms very conspicuous olive green spots, but is usually very heavily parasitised, and seldom forms perithecia. It does not agree with the description of any other species in the group with 4-septate spores and simple mycelial setae.

Meliola Excoecariae n. sp.

Amphigena, maculas rotundatas v. irregulares, 5–10 μ diam. formans; hyphis fuscis, undulatis, 6–8 μ crassis; ramis plerumque alternis; hyphopodiis capitatis alternis, stipitatis, 23–35 × 10–16 μ, cellula basali 7–10 μ long., cellula superiore varie lobata, plerumque obtuse tri-lobulata v. triangulata; hyphopodiis mucronatis oppositis v. sparsis, ampullaceis v. piriformibus, 15–20 × 6–7 μ; setis mycelicis parcis, 300–500 μ opacis, basi 6–7 μ crassis, haud attenuatis sed apice abrupte acuminatis; peritheciis atris, globosis, carbonaceis, 145–170 μ diam. (maturis?) asci evanidis, sporidiis 4-septatis cylindraceis, utrinque rotundatis, vix constrictis, 35–40 × 13–17 μ.

In foliis *Excoecariae caffrae* Buccleuch, 17/7/18, leg. Doidge (11566), Buccleuch, 23/3/16, leg. Doidge (9705).

Meliola furcillata Doidge.

This species was described ('Trans. Roy. Soc. S.A.,' vol. v, pt. 6) as occurring on the leaves of *Maesa rufescens*; later collections have been made, all on leaves of *Schmidelia monophylla*, and a careful re-examination of the original material shows that this was incorrectly determined, and that all collections of this fungus are on the same host. *Meliola furcillata* has been collected on *Schmidelia monophylla* at Amanzimtoti (Type M. H. 1573), Winterskloof, Claridge, 31/5/15 (8993) and at Buccleuch (11577).

Meliola ganglifera Kalch.

On leaves of *Curtisea faginea*, Zwartkop (11601). This fungus forms very conspicuous black spots on the leaves of *Curtisea faginea* and occurs very commonly on this plant in Natal, the Transvaal and the Cape Province.

Meliola sp. (Fig. 4).

On *Celastrus cordatus*? is a very showy species with 3-septate spores; the colonies show fairly distinct concentric zones. This species is remarkable for the very numerous larviform appendages on the perithecia; apparently almost all the superficial cells develop into appendages. The group with 3-septate spores, which is a comparatively small one, is very well represented in South Africa.

Meliola gloriosa n. sp.

Hypophylla, ferruginea, maculas orbiculares 5–10 μ diam. formans;

mycelio radiato; hyphis tenuibus, 4–5 μ crassis, tortuosis, dense intertextis, cellulis 30–50 μ longis; ramis alternis, hyphopodiis capitatis alternis, tenuibus, stipitatis, 30–80 × 13–20 μ, stipite interdum elongato et 1-septato, 14–64 μ long., diverse flexuoso v. curvato, cellula superiore 16 μ fere longa; irregulare, plerumque sub-lobata, nonnunquam inverse triangulata; hyphopodiis mucronatis parcis, pallidioribus, tenuibus, 18–20 × 5–6 μ ampullaceis v. gibbosis; setis nullis; peritheciis numerosis, globosis, atris, carbonaceis, 300–400 μ diam., appendiculis numerosis, larviformibus, subcylindraceis v. acclivis, 65–80 × 25–30 μ apice interdum recurvatis; asci evanidis; sporidiis 3-septatis, ellipsoideis, vix constrictis, 45–50 × 15–16·5 μ.

In foliis *Celastrus cordatus?* Buccleuch, Natal, 17/7/18, leg. Doidge (11565).

Meliola Hendeloti Gaill.

On *Clerodendron* sp. Buccleuch (11571).

Meliola inermis Kalch & Cke.

On *Buddleia pulchella* Buccleuch (11568).

On *Chilianthus dysophyllus* Buccleuch (11583).

This species has only been recorded in South Africa on *Buddleia* spp.

Meliola malacotricha Speg.

On *Indigofera cylindrica* Buccleuch (11560).

Meliola microspora Pat. & Gaill. var. *Africana* on *Plectranthus* sp. Buccleuch (11576).

Meliola natalensis Doidge.

This species was described ('Trans. Roy. Soc. S.A.,' vol. v, pt. 6, p. 724) on leaves of shrub unknown, Umgeni, near Durban (8980); on comparison with named specimens this host appears to be *Dovyalis tristis*, and the same species has been collected by Dr. Pole Evans on *Dovyalis rhamnoides* (Umgeni Beach, Durban, 4/6/12 [2312]).

The original specimen of *Meliola conferta* Doidge (*ibid.*, p. 724) is also on *Dovyalis rhamnoides*, and consists of some rather old material collected by Dr. Medley Wood; more recent collections on this host show that the spores in the type collection have collapsed somewhat and appear wider than normal, so that the normal measurement of the spores is 40–45 × 14–16·5 μ, rarely larger. This being the case *M. conferta* only differs from *M. natalensis* in the more crowded habit and the slightly smaller hyphopodia.

In a recent collection at Buccleuch on *Dovyalis tristis* there is a form which agrees with *M. natalensis* in the form of its hyphopodia and spores, but with quite a different habit (Fig. 5) from either *M. natalensis* or *M. conferta*; the mycelium is very diffuse, not forming definite spots, and the hyphopodia are very remote. I can only conclude that these are all forms

of a very variable fungus, and should be regarded as varieties of *M. natalensis*. The collections in the Mycological herbarium would then be classified as follows:

Meliola natalensis Doidge.

On *Dovyalis tristis* (type), Umgeni Beach, 27/5/15, Doidge (8880).

On *Dovyalis rhamnoides*, Umgeni Beach, 7/6/12, Pole Evans (2412).

Var. *conferta*; differs from the type in the crowded and usually opposite hyphopodia, which are slightly smaller than those of the type.

On *Dovyalis rhamnoides*, Durban, Medley Wood (345), (Wood, 6457), (Wood, 6454).

Var. *laxa*. Spores slightly smaller than type (seldom exceeding $40 \times 14\,\mu$), hyphopodia remote; on leaves of *Dovyalis tristis*, Hilton Road, 21/7/18, E. M. Doidge (11608).

Meliola sp. (Fig. 6).

On leaves of *Ochna atropurpurea* var. *natalitia*; this is one of the large group with 4-septate spores and simple setae; it does not agree exactly with any species previously described.

Meliola Ochnae Doidge n. sp.

Amphigena, maculas irregulares 4–8 μ diam. efficiens; hyphis fuscis, undulatis, 5–6 μ crassis; ramis oppositis, anastomosantibus; cellulis plerumque 20–25 μ long.; hyphopodiis capitatis alternis, raro oppositis, breviter stipitatis, 12–16 $\times$ 6–7 μ, cellula superiore oblonga v. ovata, saepe curva; hyphopodiis mucronatis oppositis vel sparsis, ampullaceis, 15–20 $\times$ 6 μ; setis mycelicis non numerosis, circa perithecia praecipue evolutis, simplicibus, rectis v. flexuosis, saepe subcrenulatis, acutis, 240–350 μ long., basi 6–7 μ crassis, ad apicem paulatim attenuatis; peritheciis parcis, sparsis, atris globosis, carbonaceis, verrucosis, 145–175 μ diam.; ascis evanidis; sporidiis 4-septatis, brunneis, ellipsoideis, utrinque rotundatis, leniter constrictis, 35–37 $\times$ 12–14 μ.

In foliis *Ochnae atropurpureae* var. *natalitiae* Buccleuch, Natal, 17/7/18, leg. Doidge (11567), Winter's Kloof, 1/6/15, leg. Doidge (8989).

Meliola peltata Doidge.

On *Podocarpus falcata* Buccleuch (11551); has previously been collected only on *Podocarpus latifolia* in the Cape Forests (Knysna and George).

Meliola sp. (Fig. 7).

On *Olea laurifolia*; on the same leaves as *Meliola amphitricha* and *M. ditricha* there is a third species of *Meliola* which clothes the petioles and also forms elongated colonies under the margin of the leaf; on the petioles it forms a dense black mat which readily separates from the substratum;

on the petioles also, both mycelial setae and perithecia are formed in great abundance, and they are much less numerous in the spreading colonies along the leaf margin. It belongs to the comparatively small group with definitely uncinate mycelial setae.

Meliola petiolaris Doidge n. sp.

Hypophylla et petiolicola, velutina, atra, peritheciis intra setas myceliales numerosissimas absconditis, globosis, atris, minute verrucosis, 220–250 μ diam.; mycelio ex hyphis fuscis anastomosantibus 5–6 μ crassis composito; cellulis 25–30 μ long.; ramis oppositis; hyphopodiis capitatis alternantibus, tenuibus, 15–40 μ long. × 10–13 μ crassis, cellula basali saepe 1-septata, cellula superiore obovata, truncata v. sub-lobata, hyphopodiis mucronatis non visis; setis mycelicis simplicibus, curvatis plerumque uncinatis, 150–250 μ long., basi 8–9 μ crassis, ad apicem obtusum leniter attenuatis; ascis 2–3 sporis, evanescentibus; sporidiis cylindraceis utrinque rotundatis as septa leniter constrictis, 40–44 × 13–16 μ, loculo medio saepe longiore.

In foliis et petiolis *Oleae laurifoliae* Buccleuch, Natal, 17/7/18, leg. E. M. Doidge (11558).

Meliola Podocarpi Doidge.

Associated with *M. peltata* on the leaves of *Podocarpus falcata* Buccleuch (11552), also on *P. elongata* (11561).

Meliola sp. (Fig. 8).

A rather inconspicuous species on *Popowia caffra* which has been collected several times in an immature condition. It has previously been found at Kentani (A. Pegler, 1996) (8882) and Winter's Kloof (8990).

Meliola Popowiae Doidge n. sp.

Epiphylla, effusa, pelliculas tenues nigras formans, hyphis brunneis, inaequalibus, undulatis, 6–7 μ crassis; cellulis, aliis 30 μ aliis 10 μ longis; ramis oppositis v. irregularibus; hyphopodiis capitatis stipitatis plerumque ad pares angulos hyphibus, 12–15 × 8–10 μ, cellula superiore globosa; hyphopodiis mucronatis sparsis v. oppositis ampullaceis, rectis v. curvis, 16 × 6 μ; setis mycelicis parcis, circa perithecia praecipue evolutis, simplicibus, flexuosis, 300–500 μ long., basi 10 μ crassis, nonnihil ad apicem (6–7 μ cr.) attenuatis. Peritheciis paucis, globosis, atris, carbonaceis, verrucosis 180–200 μ diam., ascis evanidis; sporidiis 4-septatis, cylindraceis, ad septa constrictis, utrinque rotundatis, 35–40 × 13–16 μ.

In foliis *Popowiae caffrae* Buccleuch, Natal, 17/7/18, leg. Doidge (11587); Hilton Road, 21/7/18, leg. Doidge (11607).

Meliola Rhois P. Henn.

On *Rhus laevigata*, Buccleuch (11582); on *Rhus* sp., Buccleuch (11595).

Meliola rigida Doidge.

On *Xymalos monospora*, Buccleuch (11578).

Meliola Toddaliae Doidge.

On *Toddalia lanceolata*, Buccleuch (11564).

Meliola varia Doidge.

On *Rhoicissus rhomboidea* Buccleuch, 20/7/18, J. Leighton (11554). This is a comparatively rare species, and was not plentiful on the host even after the exceptionally heavy rains which fell last season.

EXPLANATION OF PLATES VII AND VIII.

[All drawings were made with the camera lucida, Zeiss objective D. and a No. 5 ocular.]

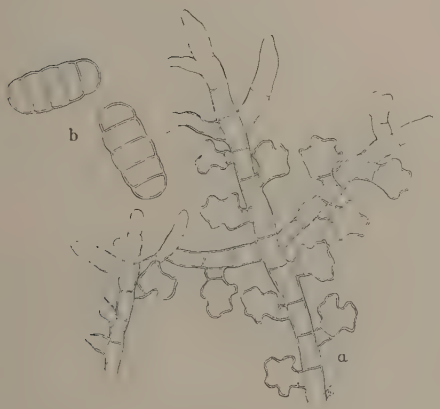
PLATE VII.

FIG.

1. *Meliola atra.* (A) Mycelium with capitate hyphopodia; (B) spores.
2. *Meliola cylindripoda.* (A) Mycelium with capitate hyphopodia; (B) hypha with mucronate hyphopodia; (C) spores; (D) tips of setae.
3. *Meliola Excoecariae.* (A) Mycelium with capitate hyphopodia; (B) hypha bearing mucronate hyphopodia; (C) tips of setae; (D) spores.
4. *Meliola gloriosa.* (A) Mycelium with capitate hyphopodia; (B) mucronate hyphopodia; (C) spores; (D) perithecial appendages.

PLATE VIII.

5. *Meliola natalensis* var. *laxa.* (A) Mycelium with capitate and mucronate hyphopodia; (B) perithecial appendages; (C) spores.
6. *Meliola Ochnae.* (A) Mycelium with capitate hyphopodia; (B) hypha with both kinds of hyphopodia; (C) tips of setae; (D) spores.
7. *Meliola petiolaris.* (A) Mycelium with capitate hyphopodia; (B) tips of setae; (C) spores.
8. *Meliola Popowiae.* Hyphae with (A) capitate hyphopodia and (B) mucronate hyphopodia; (C) tips of setae; (D) spores.



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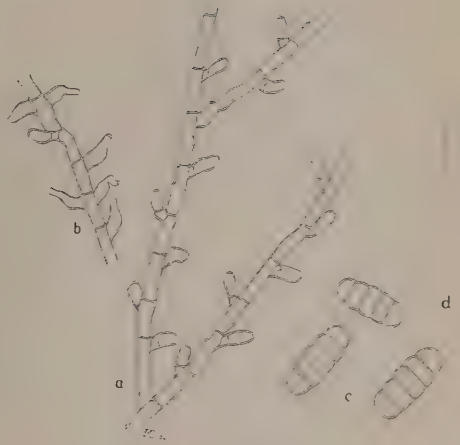

Fig. 2.

Fig. 3.

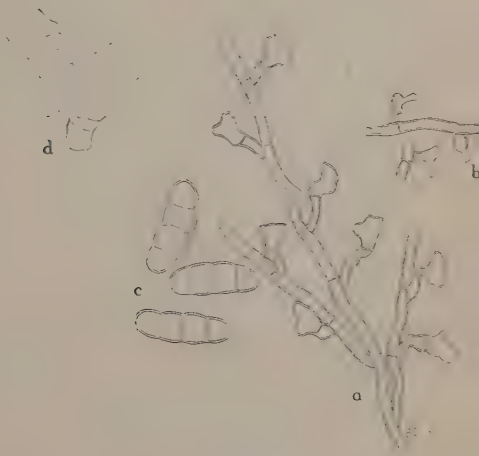

Fig. 4.

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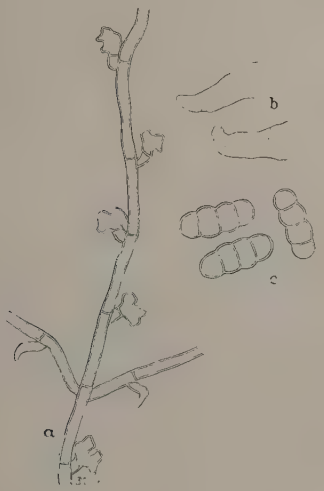

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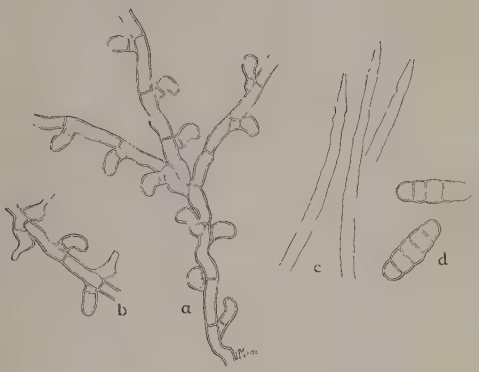

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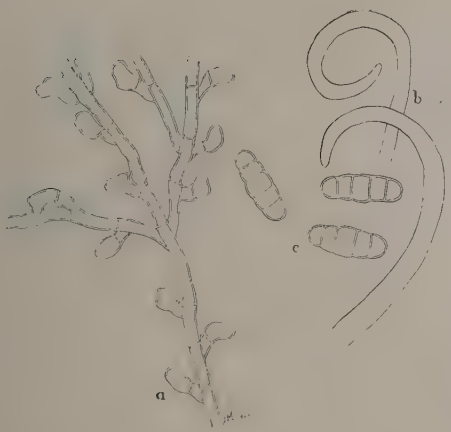

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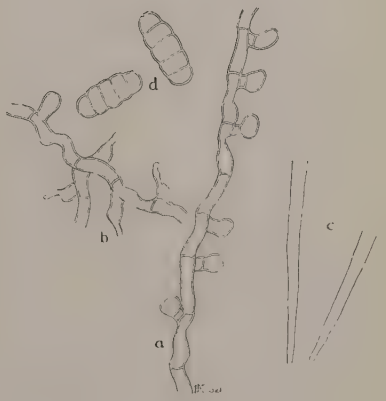

Fig. 8.

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SOUTH AFRICAN PERISPORIACEAE.

By Ethel M. Doidge.

(With seven Text-figures).

(Read May 19, 1920.)

VI. The Haustoria of the Genera Meliola and Irene.

The genus *Meliola* has received considerable attention from systematists, and is much studied from the taxonomic point of view by collectors and students of tropical and sub-tropical fungi. Comparatively little, however, is known of their method of nutrition or of their relation to the forest trees and shrubs, on whose leaves and shoots they are chiefly found. This is possibly due to the fact that until recent years these fungi were for the most part described by workers in Europe, who only had at their disposal scanty material sent to them by collectors in the Tropics.

The earlier workers, such as Bornet (1) and Gaillard (2), stated that the lesions which one sometimes observes on leaves on which these fungi grow are due to the action of numerous mites, of which one often finds the remains. Gaillard even states that he has satisfied himself by examining numerous sections that the vegetation of the *Meliolas* is entirely superficial, and does not in any way attack the tissues of the plant on which it grows.

In 1908 these statements were challenged by Maire (3) on observations which he had made on four fungi of the genus *Meliola*. The view held by some of the earlier workers that the *Meliolas* are entirely superficial and grow like the Capnodiums on the honey-dew produced by insects, he rejects on the grounds that close observation has shown that the development of these fungi is quite independent of the presence of any insects.

A second hypothesis is that the fungus derives its nourishment by osmotic interchanges between their hyphae applied to the cuticle and the epidermal cells. Maire observes that this is improbable, since the hyphae are separated from the cavity of the epidermal cells by a layer of impermeable cutin, of which the thickness is often several times that of the hypha. Moreover, the effect of the *Meliolas* on their host—neglected by most authors—is quite evident in certain cases; for instance, extended purple spots are found on leaves of *Schinus*, radiating from the point covered by the *Meliola* mycelium, and no other cause can be found for the discoloration.

Maire based his observation on four species: *Meliola amphitricha* Fr. on *Schinus molle, M. Negeriana* on *Lomatia obliqua, M. brasiliensis* var. *sanguineo-maculans* on *Schinus* sp., and one of the two European species, *M. nidulans* on *Vaccinium myrtillus.*

On examining numerous sections he found small haustoria in certain epidermal cells; these appear in the form of a very fine tube with brown walls and very clear lumen, which traverses the cuticle perpendicular to its surface or somewhat obliquely. When the cuticle is not very thick the tube traverses it without any sensible modification, and expands in the cavity of the cell into a more or less spherical vesicle with a thin hyaline wall—*e. g.* in *Schinus* sp. attacked by *Meliola brasiliensis* var. *sanguineo-maculans* and *M. amphitricha.*

When, on the contrary, the cuticle is thick, the tube completely changes its form and contracts into an extremely fine, filiform tract (about $\frac{1}{2}\,\mu$ diam.), staining bright blue with lactophenol and cotton blue, in which it is impossible to observe the protoplasmic membrane. This filiform tract expands in the cell cavity in a similar way to the one described above.

Maire experienced some difficulty in finding sections showing the actual connection of the haustoria with the hypha, as the latter frequently fall away in sectioning; but after examining a large number of sections, haustoria were found adhering to the hyphae from which they were produced. He concludes from this evidence that the *Meliolas* are true parasites, deriving their food supply from the epidermal cells of the host by means of haustoria.*

The genera *Meliola* and *Irene* are well represented in many parts of South Africa, and over fifty species have been recorded (4), although there are still many promising localities in which no collections have been made. In view of the prevalence of these fungi on our forest trees, it was suggested to me by Dr. J. W. Bews that they might have an important bearing on plant succession in the forest belts. Seedling trees are especially subject to the attacks of fungi belonging to the genus *Meliola*, and it is not uncommon to find the leaves of seedlings of certain susceptible species so covered with dark mycelium that the normal green colour is only to be seen where young leaves have recently unfolded. It therefore was a matter of considerable interest to discover to what extent the *Meliolas* are parasitic and to confirm and extend the observations made by Maire.

Dried material from the National Herbarium was employed, and although recent collections were chosen where possible, satisfactory preparations were obtained even from old material. Small areas covered with the mycelium of the fungus were cut out and boiled in 10 per cent. formalin

* A number of valuable papers by G. Arnaud, containing references to the haustoria of the *Microthyriaceae* and allied families, only came to my notice when this paper was in the press, and have not been taken into consideration.

until most of the air was expelled from the tissues, and the portions of leaf sank to the bottom of the tube. When the formalin was cold, sections were cut with the freezing microtome and transferred direct from the 10 per cent. formalin to the stain.

The stain employed was Guéguen's triple stain (5), which was recommended by Maire as giving beautiful preparations. This is a solution of Sudan III and "bleu coton" (Bleu C_4B Poirrier) in lactic acid, but "bleu coton" not being obtainable methyl blue was used and proved to be a very satisfactory substitute. The sections were left in the stain for fifteen to thirty minutes, and were then mounted and examined in lactic acid. Successful preparations showed the cuticle stained a beautiful clear red, while the haustoria and the contents of the external fungus hyphae were stained bright blue.

Some of the species of *Meliola* are very readily detached from the host, and a considerable search had to be made before sections were found showing the haustoria attached to the hyphae from which they were derived; others adhere more closely and no difficulty was experienced in demonstrating the attachment of the haustoria.

A fairly large number of species was examined, and these will be considered separately.

Meliola amphitricha Fr. has been recorded from this country on a number of hosts chiefly belonging to the Rubiaceae. The first specimen examined was on *Sapindus oblongifolius*. This plant has an ordinary mesophytic type of leaf with a fairly thick cuticle on the upper side, the cells of the lower epidermis are smaller than those of the upper, and the cuticle on the under surface is much thinner. Haustoria were present in great numbers in the epidermal cells, and the fungus being amphigenous they were observed on both the upper and the lower surface. In every case they consisted of a very fine filiform tract—which may be termed the penetrating filament—traversing the cuticle and expanding just within the epidermal cell into a small spherical thin-walled vesicle. The whole haustorium stains bright blue by the method used, and the vesicle has a single central nucleus which stains more deeply. This type of haustorium is very similar to that described by Harper (6) for many of the Erysiphaceae. On *Grumilea caffra*, which has a very thin cuticle, *Meliola amphitricha* has exactly the same type of haustorium as on *Sapindus oblongifolius*; a fungus on *Jasminum streptopus*, which is placed under *M. amphitricha*, was also examined and found to have the same type of haustorium.

The leaf of *Olea laurifolia* has a thick cuticle on the upper surface and edges, the distance from the leaf surface to the lumen of the epidermal cells being 12 to 13 μ; on the lower surface the cuticle is thinner, the distance being only 4·5 to 5 μ. There are sclerenchyma fibres scattered through the mesophyll, and occasionally occurring between the epidermis and the

palisade cells. A *Meliola* species on this host closely resembles *M. amphitricha*, and was assigned to this species, as I was in doubt as to whether the morphological differences justified describing it as distinct from *M. amphitricha*. This fungus occurs on both sides of the leaf.

No difficulty was experienced in demonstrating the haustoria of this fungus, and in observing their connection with the hyphae on the leaf surface. The penetrating filament is ·6–·75 μ thick, and stains bright blue. It passes through the cuticle, but instead of expanding into a spherical vesicle in the epidermal cell, it traverses the epidermis and penetrates into a palisade cell, or the first cell of the mesophyll encountered, according to whether the fungus is growing on the upper or under surface of the leaf. If a sclerenchyma fibre is encountered it pierces through it and so reaches a chlorophyll-bearing cell, where it expands into a thin-walled, spherical, uninucleate vesicle. The fungus, therefore, is obviously a distinct species from *M. amphitricha*. It was suggested that the character of the leaf might in some way be responsible for the form of the haustoria. Two other species of *Meliola* occur on *Olea laurifolia*, and these were examined in order to discover whether they produced the same form of haustorium.

Meliola petiolaris Doidge occurs chiefly on the petioles and on the under sides of the leaves, but often spreads somewhat from the lower side over the upper margin. On the lower surface the fungus has haustoria similar to those of *M. amphitricha*, consisting of a fine filament penetrating the cuticle and a small, spherical vesicle, about 3 μ diam., in the epidermal cell. Near the edge on the upper surface, where the cuticle is much thicker, the haustoria are similar in character, but the penetrating filament is stouter and brown-walled. This change in the character of the penetrating filament appears to be correlated with the thickness of the cuticle, and is very unusual; in every other case the form of the haustorium has been found constant for any given species. Of all the specimens examined this was the only species, with a vesicle in the epidermal cell, in which the penetrating filament retained the brown colouring of the wall of the parent hypha. Maire mentions two species, *Meliola brasiliensis* var. *sanguineo maculans*, and *M. amphitricha* on *Schinus* sp., which have this peculiarity, and considers that in hosts with a thin cuticle the tube traverses the cuticle unchanged, but when the cuticle is thick the tube decomes a very fine, filiform tract with hyaline walls. In the majority of cases I have found that there is no relation between the thickness of the cuticle and the nature of the wall of the penetrating filament, which appears to be a specific character. In the case of *M. petiolaris* the tendency is for the filament to be brown-walled and stouter where it penetrates the *thicker* cuticle.

It will be noticed that Maire found a brown penetrating filament in leaves of *Schinus* attacked by *M. amphitricha*, whereas on other hosts in South Africa this fungus has a fine, hyaline penetrating filament, which stains blue with

Gueguen's triple stain. I think it is probable that the species *M. amphitricha* as at present constituted consists of a number of species which are morphologically similar, and that the form of the haustoria should be taken into consideration by taxonomists.

The third species parasitic on *Olea laurifolia* is *Irene ditricha* (K. & Cke.), Doidge, which occurs on the upper surface. The penetrating filament is thin walled, staining blue; it traverses the cuticle and the epidermal cell and expands into a globular vesicle just inside one of the palisade cells. It thus differs from the first of the fungi described on this host only in the broader penetrating filament, which in this case is about 1·5 μ thick.

Irene ditricha also occurs on *Celastrus* sp.; the form on *Olea laurifolia* differs in one or two minor points, and should perhaps be considered a variety. The leaf of this plant becomes discoloured over a considerable area, the centre of which is the *Meliola* mycelium; the discoloured parts become yellowish brown. This fact makes the leaf rather an unfavourable one for study as the contents of the epidermal and hypodermal cells are badly disorganised and stain deep blue. The haustoria appear to be similar to those of *I. ditricha* on *Olea laurifolia.*

Meliola carissae Doidge occurs on *Carissa arduina*, which has a leaf with a very thick cuticle. The penetrating filament is fine, staining blue, but its walls are often brown or brownish for a short distance where it enters the cuticle. The vesicle is in the epidermal cell, and is of the usual type, thin-walled, globular, hyaline and uninucleate.

Meliola leptidea Syd. on *Cussonia umbellifera* has also what may be termed the ordinary type of haustoria, with a fine penetrating filament and a globular vesicle in the epidermal cell. These are very small and inconspicuous, but the contents of the epidermal cells are obviously disorganised and filled with a granular deposit.

This type of haustorium was also produced by *Meliola ganglifera* K. & Cke. on *Curtisea faginea* and *M. capensis* (K. & Cke.) Th. on *Hippobromus alatus.*

Meliola bifida Cke. on *Osyridicarpus natalensis* occurs on the stems, and no satisfactory preparations could be obtained of this species, as the stem was too hard to cut with the freezing microtome, and the fungus very readily became detached from the host.

Meliola Evansii Doidge is found on *Scolopia* sp. Here the haustorium penetrates to the hypodermal cell (Fig. 1). The penetrating filament is hyaline and stains blue, but is fairly stout, and the expanded vesicle is formed in the chlorophyll-containing cell of the mesophyll which is encountered.

Exceptionally clear preparations were obtained of *Meliola arcuata* Doidge on *Viscum anceps* (Fig. 2). The stem—it is a leafless species of *Viscum*—has a very thick cuticle which is traversed by a fine penetrating filament, and swells into a globular uninucleate vesicle just inside the epidermal cell.

Irene natalensis Doidge is found on several species of *Doryalis*. The specimen selected was on the upper surface of the leaves of *D. tristis*, which have a thin cuticle. The penetrating filament has brown walls like those of

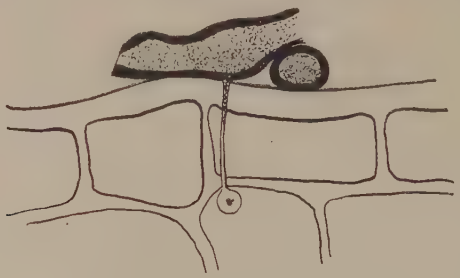

Fig. 1.—Haustorium of *Meliola Evansii* penetrating into leaf of *Scolopia*, sp. (comp. oc. No. 8). All the figures were drawn with the aid of the camera lucida and a Zeiss $\frac{1}{12}$-in. oil-imm. obj.

the mycelial hyphae, but very much thinner, and it passes through the epidermis into the first layer of palisade cells, the expanded vesicle being just within the latter. These haustoria differ from those of *M. Evansii* in

Fig. 2.—Haustorium of *M. arcuata* in epidermal cell of *Viscum anceps* (comp. oc. No. 4).

the brown coloration of the walls of the penetrating filament. The latter may be at right angles to the leaf surface, but is very often oblique and sometimes its course is quite crooked or even tortuous.

Irene puiggarii Speg., which occurs on a number of rosaceous hosts, is

morphologically similar to *I. natalensis*, differing only in minor points in the form of the hyphopodia and spores. It is interesting to find, therefore, that the haustoria are of a different type. Those of *I. puiggarii* have a fine, blue-staining penetrating filament, and a small uninucleate vesicle about 6 μ diam. in the epidermal cell. The specimen examined was on *Cliffortia strobilifera*, which has not a very thick cuticle, but it is wavy in outline. The difference in the haustoria cannot be accounted for by the character of the host plant, for both species occur on plants with quite a mesophytic type of leaf.

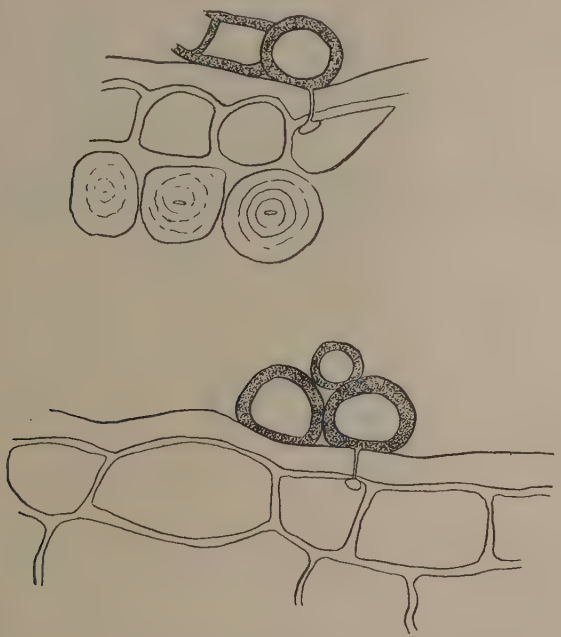

Fig. 3.—*M. Podocarpi* on leaf of *Podocarpus falcata* (comp. oc. No. 8).

Some of the most interesting results were obtained in connection with two fungi parasitic on *Podocarpus* spp., which further emphasise the fact that the form of the haustorium is a specific character, and is not dependent to any great extent on the structure of the host.

Irene podocarpi Doidge is found on *Podocarpus Thunbergii*, *P. falcata* and *P. elongata*, and specimens on the two last-named hosts were examined. This fungus has the most usual form of haustorium, consisting of a thin-walled penetrating filament with a small vesicle in the epidermal cell (Fig. 3). It occurs mostly on the under side of the leaf where the cuticle is not very thick.

Meliola peltata Doidge occurs on *P. Thunbergii* and *P. falcata*; these two species have a very similar leaf structure, while that of *P. elongata* differs considerably, being quite of the ordinary mesophytic type.

The leaves of the first two species have a thick cuticle, especially on the upper side, and just under the epidermis there are one, two or three rows of sclerenchyma fibres. These form a continuous band on the upper surface, but on the lower surface they are interrupted in the neighbourhood of the stomata.

The fungus examined was on the lower surface of *P. Thunbergii*; it closely follows the contour of the leaf, completely blocking the depression above the stomata and pressing on to the guard-cells. This circumstance, which has not been mentioned before, was noticed in a number of the species examined and is apparently of constant occurrence (Fig. 4).

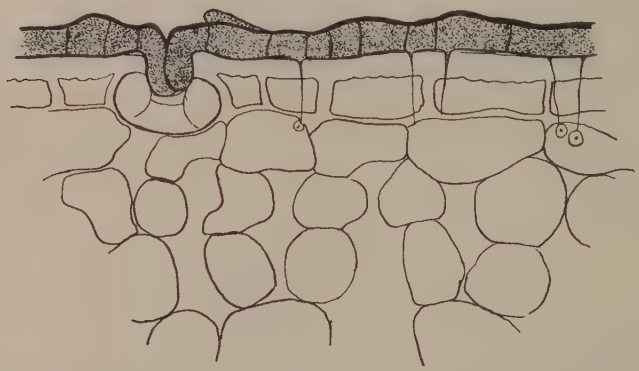

FIG. 4.—Hyphae of *M. peltata* on leaf of *Podocarpus Thunbergii* (low magnification, comp. oc. No. 1), showing five haustoria, and the hyphae following the contour of the leaf into the depression above the stoma, and completely blocking the stoma.

No haustoria were seen penetrating the guard-cells, but numerous thick-walled filaments penetrate the thick cuticle, traverse the epidermal cells, and the sclerenchyma fibres if these are encountered (Fig. 5), and enter the first layer of chlorophyll-containing mesophyll cells. The latter are considerably disorganised and stain deeply with the methyl blue.

Where it begins to penetrate the cuticle the haustorium is slightly bulbous or funnel-shaped, and measures 4·6–5 μ in diameter (Fig. 6). This diameter immediately below decreases to about 1·5 μ, often continuing to taper slightly till it reaches the mesophyll cell, where it expands into a globular or ovoid vesicle, 4·5–5 μ diam. The penetrating filament is brown throughout, but becomes paler as it grows away from the external hypha; the vesicle is delicate, hyaline, stains a clear blue, and has a single, central,

deeply staining nucleus. The shortest penetrating filaments, found where the chlorophyll-containing cells were immediately under the epidermis, were 17–20 μ long; the average length where two sclerenchyma fibres were traversed was 40 μ (Fig. 6), and in exceptional cases where there were three layers of fibres under the epidermis they were up to 60 μ long. Cases were observed where the haustorium pierced through the lateral wall of the epidermal cell (Fig. 7).

The haustoria could be readily picked out with the low power of the microscope; fairly thick sections were better than extremely thin ones, as the latter did not show the entire course of the penetrating filament. The filaments were for the most part straight and perpendicular to the leaf surface or somewhat oblique, but a few were curved or even tortuous.

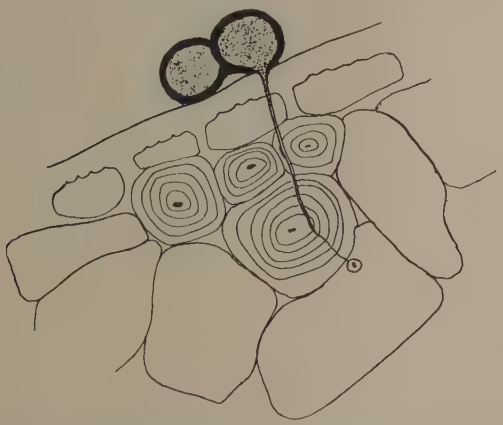

Fig. 5.—Shows the haustorium of *M. peltata* penetrating through two sclerenchyma fibres (comp. oc. No. 2).

The penetrating power of the haustorium is best realised in examining a transverse section, in which the thickness of the walls of the sclerenchyma fibres is most evident (Fig. 5). On the upper surface of the leaf on which the fungus is able to flourish, the distance from the leaf surface to the first chlorophyll-containing cells is often as much as 130 μ.

The other genera of the *Perisporiaceae* are poorly represented in South African species in the National Herbarium. Two of these fungi, *Zukalia transvaalensis* and *Phaeodimeriella capensis*, on careful study proved to be parasitic on *Asterina* spp., the hyphopodiate mycelium described for these two species being that of the host, and the mycelium actually belonging to them forming a weft of pale fine hyphae investing the *Asterina* mycelium. *Zukalia transvaalensis* should therefore be placed in the genus *Perisporium*.

Dimeriella annulata Syd. has a large part of its mycelium internal to the leaf, lying between the cuticle and the epidermis, and therefore does not belong to the genus *Dimeriella* as at present defined.

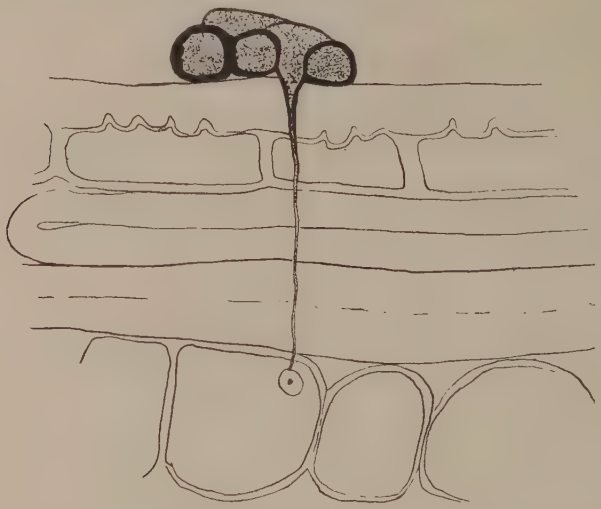

Fig. 6.—Shows sclerenchyma fibres in longitudinal section penetrated by the haustorium of *M. peltata* (comp. oc. No. 6).

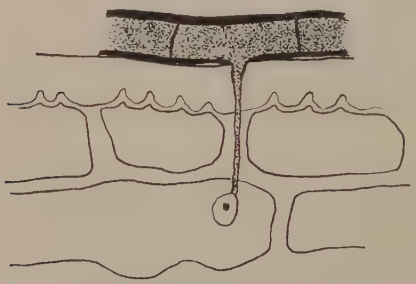

Fig. 7.—Haustorium of *M. peltata* piercing its way through in wall of epidermal cell (comp. oc. No. 8).

Balladyna velutina (B. & C.) v. Höhn on *Kraussia floribunda* and *Dimerium psilostomatis* (Thuem) Sacc. on *Plectronia ciliata* have the same type of haustoria as many species of *Meliola*. The penetrating filament is thin-walled, staining blue, and there is a hyaline, globular, thin-walled uninucleate vesicle in the epidermal cell.

Summary.

The fungi belonging to the genus *Meliola* are true parasites, sending haustoria into the cells of the host.

The most common type is that which has a fine filament penetrating the cuticle and a small, globular, thin-walled, uninucleate vesicle in the epidermal cell.

The nature of the filament, whether hyaline or brown, thick or thin, appears to be a character specific to the fungus concerned, and is not generally, as suggested by Maire, correlated with the thickness of the cuticle to be traversed.

Certain species penetrate through the epidermis, through sclerenchyma cells, if these are present, into the first chlorophyll-containing cells of the mesophyll; but the form of all the haustoria examined was in general the same, consisting of a penetrating filament and a delicate uninucleate vesicle. The differences in different species consist in the length and character of the penetrating filament.

The character of the penetrating filament is of diagnostic value; and may, in some cases, be employed as a determining factor when there is any question of the identity of two species.

The haustoria cause a considerable disorganisation of the cells into which they penetrate, and the mycelium completely blocks many of the stomata. The fungi of the genus *Meliola* must therefore have a prejudicial effect on plants which are heavily infected, especially on the young seedling trees which seem to be generally susceptible.

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OF MYCOLOGY
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[illegible], A NEW GENUS OF THE MICROTHYRIACEÆ.

by Ethel M. Doidge.

VOLUME VIII.—PART 2.
1920.

CAPE TOWN:
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new Amazonia

MELIOLASTER, A NEW GENUS OF THE MICROTHYRIACEAE.

By Ethel M. Doidge.

(Read August 21, 1918.)

As a result of the work of re-examination and revision of certain ascomycetes carried out in recent years by v. Höhnel and Theissen, the group formerly known as the Perisporiales* has been entirely reorganised. It was laid down by v. Höhnel† that only species showing the so-called "inverse-radial" structure of the perithecium should be included in the Microthyriaceae; a number of species with hemispherical perithecia but not showing this typical structure were thus excluded, and for these Theissen constituted the families *Hemisphaeriaceae*‡ and *Trichopeltaceae*,§ the latter group consisting of forms with a thallus-like structure, and with fruiting bodies formed "pycnotically" in the thallus. The three families, *Microthyriaceae*, *Hemisphaeriaceae* and *Trichopeltaceae*, constitute the group *Hemisphaeriales*, and are thus contrasted with forms having spherical perithecia like the *Perisporiaceae*. In both groups certain genera, *e. g. Meliola* and *Asterina*, bear hyphopodia at regular intervals on the mycelium; the division into families is based only on the structure of the fruiting bodies, but mycelial characters are often used as generic distinctions.

This being the case it is interesting to find amongst fungi occurring in South African forests, species which appear to be intermediate in character, and in which are combined peculiarities of more than one family. The vegetative stage of the *Trichopeltaceae* consists of a flat ribbon or disc formed by the repeated branching of the constituent hyphae, which are fused by their lateral walls; the "pycnothecia," as the fruiting bodies are called, are hemispherical, and are formed in the vegetative membrane by the thickening of certain portions of it. This group thus forms a very complete contrast to fungi like the *Meliolas* which have a filamentous, spreading mycelium, and spherical perithecia which are quite a distinct development from the vegetative mycelium.

* Engler, 'Die Pflanzenfamilien.'

† v. Höhnel, 'Fragm. z. Mijk.,' x, p. 13, ff.

‡ Theissen, 'Ann. Myc.,' xi (1913).

§ Theissen, 'Mycologische Centralb.,' iii, No. 6, pp. 273–286.

Meliola peltata,* a species found on *Podocarpus latifolia* and *P. falcata* (it does not to my knowledge occur on *P. elongata*), although its perithecia are spherical and its spores typical of the genus *Meliola*, in its vegetative stage strongly recalls the *Trichopeltaceae*. The spore on germination gives rise to hyphae, which branch repeatedly and become fused into a flat membrane, which develops into a more or less spherical disc. It differs from the vegetative thallus of the disc-forming *Trichopeltaceae* (*e.g. Brefeldiella*) only in the thicker hyphae which compose it, and in the presence of 2-celled hyphopodia, which can be traced on most of the branches forming the membrane.

In a recent collection from Buccleuch, Natal, an equally interesting fungus was found on the leaves and stems of *Piper capensis*. In this case the mycelium and spores are those of a typical *Meliola*, but the perithecium is of the *Microthyriaceae* type. The hyphae are thread-like, creeping over the leaf-surface, and bearing 2-celled capitate hyphopodia at regular intervals, and less frequently mucronate hyphopodia. The formation of the thyriothecium is similar to that of *Asterina*; a number of cells formed laterally on a hypha by repeated division (apparently by the septation of one of the hyphopodia) form a small group of parenchymatous cells between the mycelium and the leaf-surface, and these are the initial cells of the perithecial membrane. Each cell grows in a centrifugal direction, forming a series of radiating hyphae, which are fused by their lateral walls; thus a compact disc is formed, increase in circumference being provided for by the forking of the constituent hyphae. These hyphae are not fused for the whole of their length but are free at the circumference, giving the thyriothecium a fimbriate appearance. The thyriothecium differs from that of a typical *Asterina* only in the slightly stouter hyphae which form the membrane and in the presence of typical hyphopodia on the free ends of these hyphae. Dehiscence is stellate, as in *Asterina*, but the asci are 2-spored and evanescent as in *Meliola*, and the spores identical with those of the latter genus. This is interesting in view of Theissen's† statement that the hemispherical form of the fruiting body is evidently a development of the complete spherical form; that the thyriothecium of the *Microthyriaceae* has been reduced so that only the basal half has been formed, but this has been turned upside down and the perithecial wall is therefore "inverse."

There is no genus described with this type of perithecial membrane and 4-septate brown spores. I have therefore named this fungus *Meliolaster*, since it combines certain characters of the genera *Meliola* and *Asterina*.

Judging by the description given by Winter ('Hedwigia,' 1886, p. 96) and Gaillard ('Le Genre *Meliola*,' p. 58) it is possible that this fungus may

* Doidge, E. M., 'Trans. Roy. Soc. S.A.,' vol. v, pt. 6, pp. 727 and 744, pl. lxi, fig. 18

† See footnote, p. 121.

be identical with *Meliola asterinoides* Wint., in which case it should be named *Meliolaster asterinoides* (Wint.), but as I have not seen specimens of *M. asterinoides*, and it is not safe to assume the identity of the two fungi without comparison, I have described the Buccleuch specimen as *Meliolaster Mackenzii* n. sp.

MELIOLASTER Doidge nov. gen. MICROTHYRIACEARUM.

Thyriothecia superficiala, atra, carbonacea, applanato-hemisphaerica, ex hyphis radiatis contexta demum stellatum dehiscentia. Mycelium hyphopodiatum. Asci aparaphysati. Sporidia 4-septata, brunnea.

Meliolaster Mackenzii Doidge n. sp.

Hypophylla, plagulas minutas, rotundatus, 1·5–2·5 mm. diam. formans; mycelio laxo, ex hyphis flexuosis vel fere rectis, 6–7 μ crassis composito; ramis alternis; cellulis 15–16 μ longis; hyphopodiis capitatis, alternis vel unilateralibus, brevissime stipitatis, curvatis, 10–15 × 6–7 μ, cellula superiore sub-globosa, convexa; hyphopodiis mucronatis ampullaceis, inter hyphopodia capitata sparsis, apice interdum sub-uncinatis, 12–15 × 6–7 μ; thyriotheciis dense aggregatis, orbicularibus vel a latere compressis, applanato-hemisphaericis, 250–350 μ diam., contextu ex hyphis rectis, 4–6 μ latis in articulos circum 10 μ longos divisis composito, peripherice copiose fimbriatis; ascis aparaphysatis, evanescentibus, ellipsoideis, bisporis, 50–57 × 20–23 μ; sporidiis cylindraceis, compressis vel sub-clavatis, 4-septatis, utrinque rotundatis, leniter constrictis, 33–37 × 10–13·5 μ.

Hab. in foliis *Piperis capensis*, 17/8/18, Buccleuch, Natal, leg. E. M. Doidge, M.H. No. 11570.

The formation of thyriothecia begins when the colony is quite small, the first being formed near the centre; one, two or more secondary thyriothecia then arise in close proximity, and these become flattened and the circular outline somewhat lost by coming into contact before growth is complete. As in *Meliola* the asci disappear as soon as the spores are formed, and before they change colour. The spores germinate as in *Meliola* and *Asterina* by producing hyphopodia first and then a hyphal branch, usually from the terminal cells. Hyphopodia are developed regularly as in many *Meliolas*, one being formed from each cell, in close proximity to the dividing wall.

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SOUTH AFRICAN MICROTHYRIACEAE.

By Ethel M. Doidge.

(With Plates XIII–XIX.)

The family *Microthyriaceae* was first described by Saccardo ('Syll. Fung.' ii, p. 658, 1883) as follows: "Simplices (*i. e.*, without a stroma) Perithecia subsuperficiala, nigricantia, membranacea vel carbonacea, dimidiata, applanata, contextu plerumque eximio radiato, centro pertusa vel astoma. Asci 4–8 spori, saepe breves." In describing fungi in those early days, the morphological structure of the reproductive bodies was not minutely studied, and gradually a large number of genera and species of very varying character was assigned to the *Microthyriaceae*. The only character which these forms theoretically had in common was the flattened, shield-like form of the perithecia. In practice even this characteristic was not always taken into account. During the last ten years, however, the enormous task of revision has been carried out chiefly by von Höhnel (1) and Theissen (2–10); a large number of genera, including all forms which are not strictly superficial, have been excluded, and the whole group completely reorganised.

In Engler's 'Die Pflanzenfamilien,' 1897, Lindau includes the *Microthyriaceae* in the group *Perisporiales* with the *Erysiphaceae* and the *Perisporiaceae*; but although they have some points in common, the *Microthyriaceae* differ widely from the other two families in the form of the fruiting body, which is not a "perithecium" in the true sense of the word, but a flattened, shield-shaped structure, usually in the form of a flattened hemisphere. Theissen classifies together all the superficial ascomycetes with hemispherical fruiting bodies (which he terms "thyriothecia") in a new group, the *Hemisphaeriales* (6, 8). Within this group he distinguishes three families: the *Microthyriaceae*, with filamentous mycelium and thyriothecial membrane formed of radiating hyphae; the *Hemisphaeriaceae*, which differ from the *Microthyriaceae* in the more or less reticulate—not radiate—structure of the thyriothecial membrane; and the *Trichopeltaceae* (9), which, instead of a network of filamentous hyphae, form a ribbon-like thallus in which the thyriothecia are developed pycnotically.

Of these three families this paper only deals with the *Microthyriaceae* as delimited by Theissen. He assigns to this family some twenty genera, of which only eight have representatives described as occurring in South Africa.

General Characteristics.

The mycelium may be persistent or evanescent; in the latter case it is poorly developed, and disappears as soon as the thyriothecia are formed.

The genus *Asterina* (2) may be taken as typical of the family; in this genus the spore germinates at one or both poles, as a general rule sending out first a small papilla of limited growth which closely resembles in form the hyphopodia on the mycelium; one or two germ tubes are subsequently developed from each pole, and these elongate, forming septate hyphae which branch alternately and produce hyphopodia at more or less regular intervals. The hyphopodia are extremely varied in form, and are of the greatest diagnostic value. Alternate branching is the rule, but in some species opposite branching is predominant. The mycelium develops centrifugally, and the mother spore can long be detected unaltered in the centre; its persistent character is often useful in determining the nature of the epispore at maturity, when the spores in the ascus are more or less immature. In a few species of *Asterina* typical hyphopodia are not developed, their place being taken by so-called "node-cells," which are spherical or hemispherical, swollen cells placed at regular intervals. These species may be regarded as intermediate forms between the genus *Asterina* and genera like *Asterinella* (3), in which no hyphopodia are developed.

The thyriothecium originates from a medial cell of a hypha, or from the terminal cell of a short lateral branch. In either case the initial cell divides rapidly and forms a group of small polyhedral cells between the hypha and the leaf surface. Each of the cells comprising this group begins to grow in a radial direction, each one forming a radiating hypha which is in close contact with its neighbour and is attached to it by the radial walls. The increase in circumference, as the disk increases in size, is provided for by the repeated bifurcation of the constituent hyphae. These are sometimes connected throughout their length, forming a compact disk with an entire or crenate margin; but more frequently they are free at the circumference, giving the thyriothecium a fimbriate appearance. The central part has meanwhile become arched to form the perithecial cavity, while the peripheral zone remains appressed to the leaf surface. Theissen regards this structure as a development of the complete spherical form found in the *Perisporiaceae*; the thyriothecium consists only of the basal half, which has been turned upside down, and hence is called "inverse." This inverse form, together with the radial-prosenchymatous structure of the membrane, is typical of the thyriothecia of the *Microthyriaceae* proper.

The thyriothecium has no typical ostiole; at maturity the initial group of cells may break away, forming a central pore, but the spores usually escape—in the genus *Asterina*—through radial or irregular fissures in the membrane. In *Lembosia* and its allied genera the thyriothecium dehisces by a longitudinal slit, and in the genus *Englerulaster* the outer membrane

breaks down from the centre, falling apart into separate cells, with abundant secretion of mucilaginous matter.

The pycnidia (*Asterostomella*) in the genus *Asterina* are usually identical in form with the thyriothecia, but they are smaller; these were often mistaken by the earlier workers for thyriothecia, and described as such, the brown, continuous conidia being taken for ascospores and described as a separate genus *Asteronia*. Of the conidia of *Asterinella* Theissen (3) says very little, but mentions conidia of the *Asterostomella* type in one species, and in his key to the genera he includes the genus in the section with one-celled conidia. Of the four South African species one has conidia of the *Asterostomella* type, one has hyaline, curved, aseptate conidia, and in a third they are hyaline, fusiform and four-celled; in each case they are borne in pycnidia resembling thyriothecia.

In the genus *Clypeolella* the conidia are four-celled, and are borne on the mycelial hyphae; more than one superficial fungus has been collected showing this type of conidium, but in every case the thyriothecia were very immature, so that it was impossible definitely to identify any one of them as a *Clypeolella*, and it is still uncertain whether this genus occurs in South Africa.

The asci may be paraphysate or aparaphysate, and in some cases the presence or absence of paraphyses is used as a generic distinction; they vary in form from elliptic or clavate to spherical. There is also considerable variety in the spore forms of the different genera, but in the majority they are two-celled, and either hyaline or brown.

THE SOUTH AFRICAN GENERA.

The genus *Asterina* Lév. has the largest number of species. In his monograph on this genus, Theissen describes 108 species, of which 55 are from South America; he only records 6 genuine species from Africa. A much larger number of fungi has been described from South Africa as belonging to the genus *Asterina*, the greater part collected by MacOwan and Medley Wood, and described by Kalchbrenner and Cooke in Grevillea; a few were described at a later date by Winter, Hennings, and Sydow, making 22 species in all. Of these 11 are excluded as not belonging to the *Microthyriaceae* as now defined; Theissen excludes a still greater number on account of the absence of thyriothecia in the type specimens, but a number of these I have fortunately been able to re-collect and re-describe.

In the present paper 30 species of *Asterina* are recorded from South Africa, and are represented in the National Herbarium, Pretoria. These are as follows:

Sub-genus *Dimerosporium*.—13 new species; 1 new variety of a Brazilian species; 4 amplified descriptions of species previously recorded but imper-

fectly described, or type not showing thyriothecia; 4 species previously described.

Sub-genus *Clypeolaster*.—1 new species; 2 new varieties; 3 species previously described, and 2 species recorded from Brazil.

The limits of the genus *Asterina* are not at all sharply defined; the typical form of the thyriothecium is the flattened hemisphere, but not infrequently elongated thyriothecia occur amongst the hemispherical ones; the round *Asterina* thyriothecia graduate into the linear *Lembosia* form, and in some species it is difficult to decide which is the predominating type. The chief distinction between these genera, apart from the shape of the thyriothecium, is that in *Lembosia* the asci are elliptical or cylindrical, and paraphysate, while in *Asterina* they are more or less spherical, and in the sub-genera *Dimerosporium* and *Clypeolaster* they are aparaphysate; but this character does not serve to distinguish the genus *Lembosia* from the genus *Parasterina*, which also has paraphysate asci.

On the other hand, the thyriothecia often approach the sub-spherical form of *Englerulaster*; in the latter genus the cells of the thyriothecial membrane fall apart from the centre outwards, with abundant formation of mucilaginous matter; in some species of *Asterina* the central cells break down in a very similar way, but the process does not extend outwards to the circumference; the dividing line between the genera *Asterina* and *Englerulaster* is, therefore, not at all sharp.

The same applies to the genera *Asterina* and *Asterinella*; the *Asterina* species with regular node-cells approach very close to the *Asterinella* species with more or less torulose mycelium. The genus *Seynesia*, which is an *Asterina* without persistent mycelium, is only represented by one species, and so also the genera *Microthyrium*, *Amazonia* and *Morenoina*. In the genus *Lembosia* three species are described, of which only one has been previously recorded; none of the four species of *Asterinella* described agree with any of the species mentioned in Theissen's monograph of the genus. *Morenoella*, which differs from *Lembosia* only in the absence of paraphyses, is represented by one species hitherto undescribed. *Englerulaster Gymnosporiae* was included in a previous paper (11) in the genus *Dimerium*; of the other two species now described, one has only been recorded from North America, and the other is apparently new to science.

Geographical Distribution, etc.

It has been pointed out in connection with the genus *Asterina* that a large proportion of the described species are South American, and this is equally true of the other genera of the *Microthyriaceae*, but whether this indicates that there are actually a larger number of species in South America, or that more complete collections have been made there than in Africa, remains to be proved.

The distribution of the family in South Africa coincides with that of the *Perisporiaceae*, abundant material being found in all the humid, wooded districts; but the collection in the National Herbarium is necessarily still very incomplete, and no collections at all have been made in many very promising localities.

A series of permanent microscopic preparations has been made by the collodion method (11) of all the specimens mentioned, and is kept for reference in the Union Botanical Laboratory, Pretoria. For the determination of the greater part of the host plants, particularly those collected in the Transvaal, I am indebted to Miss S. M. Stent, to Dr. J. W. Bews and Mr. T. R. Sim for the identification of a number of Natal plants, and to Dr. S. Schönland and Miss Gane of the Albany Museum, for naming a large collection of plants from the Eastern Province. I am also indebted to Miss A. Pegler and others for a number of very interesting specimens.

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(11) Doidge.—"South African Perisporiales," 'Trans. of the Royal Soc. of S. Af.,' v, pt. vi, 1917, pp. 713–750.

Microthyriaceae.

Mycelium persistent or evanescent, thyriothecia superficial, inverse, radiate, flattened-hemispherical or linear; asci paraphysate or aparaphysate, 2–8-spored, elliptic or clavate to sub-spherical. Spores varying in form,

hyaline or brown. Occur on living leaves and young parts of plants in humid situations.

Key to the Genera.

(After Theissen, Myk. Centralb. iii, p. 281.)

A. Free mycelium wanting.
- I. Spores 1-celled.
  - *a.* Spores hyaline . . . . . *Myocopron.*
  - *b.* Spores brown . . . . . *? Vizella.*
- II. Spores 2-celled.
  - *a.* Spores hyaline . . . . . *Microthyrium.*
  - *b.* Spores brown.
    - *x.* Thyriothecium circular . . . *Seynesia.*
    - *xx.* Thyriothecium linear.
      - i. Asci paraphysate . . . *Lembosina.*
      - ii. Asci aparaphysate . . . *Morenoina.*
- III. Spores 3-celled, brown, walls sub-polar . . *Scutellum.*
- IV. Spores 4-celled, brown . . . . *Halbania.*
- V. Spores more than 4-celled, hyaline . . *Phragmothyrium.*
- VI. Spores linear, filiform . . . . *? Ophiopeltis.*

B. Free mycelium present.
- I. Spores 1-celled, brown . . . . *Lembosiella.*
- II. Spores 2-celled.
  - *x.* Spores hyaline.
    - 1. Thyriothecia round.
      - i. Mycelium with hyphopodia . . *? Asterella.*
      - ii. Mycelium without hyphopodia . *Calothyrium.*
    - 2. Thyriothecia linear . . . . *Lembosiopsis.*
  - *xx.* Spores brown.
    - 1. Thyriothecia round.
      - i. Mycelium with hyphopodia.
        - *o.* Thyriothecial wall 1-layered, conidia 4-celled . . . *Clypeolella.*
        - *oo.* Thyriothecial wall with more than one layer of cells, conidia usually 1-celled.
          - /. Thyriothecial membrane secreting mucilage externally and internally, breaking down centrifugally and becoming separated into single cells . . . . *Englerulaster.*

	//. Thyriothecial membrane not secreting mucilage externally, at the utmost breaking down only in the centre.	
	a. Asci paraphysate	*Parasterina.*
	b. Asci aparaphysate	*Asterina.*
	ii. Mycelium without hyphopodia	*Asterinella.*
2.	Thyriothecia linear.	
	i. Asci paraphysate.	
	a. Mycelium hyphopodiate	*Lembosia.*
	b. Mycelium non-hyphopodiate	*Echidnodes.*
	ii. Asci aparaphysate.	
	a. Mycelium hyphopodiate	*Morenoella.*
	b. Mycelium non-hyphopodiate	*Echidnodella.*
III.	Spores 5-celled, brown	*Amazonia.*

Microthyrium Desm.

Ann. Sc. nat. xv, p. 137 (1841); Syll. Fung. ii, p. 662.

Thyriothecia superficial, dimidiate, flattened-hemispherical, formed of radiating hyphæ. Asci aparaphysate. Spores hyaline, 2-celled. Free mycelium absent.

Microthyrium maculicolum Doidge, sp. nov.

Plate XVIII, fig. 40. Slide XLVI, 18.

Epiphyllous, forming raised, blister-like, light-brown areas up to 1 cm. diam. on the upper side of the leaf, on which the thyriothecia are visible as minute black points. Mycelium pale, effuse, evanescent. Thyriothecia dark brown, numerous, scattered or sub-gregarious, flattened hemispherical, sometimes more or less angular by contact, 150–190 μ diam.; composed of radiating hyphæ 3–4 μ thick, cells 3–10 μ long, central cells almost cubical, the more elongated ones near the circumference, margin entire. Asci 8-spored, not numerous, usually 3–7 in each thyriothecium, aparaphysate, elliptical with broadly-rounded apex, 70 × 27 μ, or obovate, 50–57 × 30–43 μ, apedicellate, uniformly thinly tunicated, wall barely 1 μ thick. Spores conglobate or sub-parallel, hyaline, 1-septate, upper loculus decidedly broader, 21–23·5 × 6·5–10 μ.

On leaves of *Capparis*? sp., Durban, 11/4/18, Bottomley, 11668.

Seynesia Sacc.

Syll. Fung. ii, p. 668.

Similar to Microthyrium, but spores brown.

Seynesia orbiculata Syd.

Ann. Myc. x (1912), p. 39.

Thyriothecia epiphyllous, gregarious, always forming orbicular groups 4–8 mm. diam., very closely packed, opaque, formed of radiating hyphæ, mostly hemispherical, 90–175 μ diam., less frequently somewhat elongated or irregular, in which case they are longer. No free mycelium. Asci ovate to clavate, thickened at the apex, 35–60 × 16–25 μ, 8-spored. Spores distichous or conglobate, ellipsoid, rounded at both ends, 1-septate, constricted, smooth, brown, 13–18 × 6–8 μ, cells equal.

On leaves of *Euclea* sp., Letaba Drift, Zoutpansberg Dist., 6/8/11, Doidge, 1808.

MORENOINA Th.

Ann. Myc. xi (1913), p. 434.

Free mycelium wanting; thyriothecia linear to oblong, inverse, radial-prosenchymatous in structure, asci aparaphysate, spores 2-celled, brown.

Morenoina africana Doidge sp. nov.

Plate XVIII, fig. 41. Slides XLIV, 15, 16.

Epiphyllous; mycelium none, or represented by a few pale, poorly developed hyphæ. Thyriothecia scattered or confluent in small groups, linear-ellipsoid, 120–400 × 65–100 μ, straight or slightly curved, less frequently somewhat sinuous or forked, dehiscing by a longitudinal slit almost the length of thyriothecium; radiating hyphæ 2·5–3 μ thick, cells almost cubical; margin fimbriate. Asci (immature) aparaphysate, ellipsoid-clavate, briefly pedicellate, 23–27 × 10–12 μ, not staining blue with iodine. Mature spores only seen outside the ascus, fuscous, 2-celled, scarcely constricted, smooth, 12–14 × 5–6·5 μ, cells equal.

On pinnules of *Dryopteris inaequalis*, Zwartkop, Natal, 19/7/18, Doidge, 11605.

ENGLERULASTER von Höhn.

Fragm. z. Myk., Bd. x, Nr. 520.

Mycelium superficial, branched, septate, with regular hyphopodia. Thyriothecia hemispherical or almost spherical, inverse, radial-prosenchymatous; at maturity the thyriothecial membrane breaks down from the centre, falling apart into separate cells, with abundant formation of mucilaginous matter. Ascospores brown, 2-celled.

Key to the Species.

A. Spores not more than 30 μ long.
  a. Thyriothecia 90–110 μ diam. . . . . 1. *E. Gymnosporiae.*
  b. Thyriothecia 160–190 μ diam. . . . 2. *E. Popowiae.*
B. Spores 33–36 μ long . . . . . 3. *E. orbicularis.*

1. **Englerulaster Gymnosporiae** (P. Henn.), Th.

Slide I, 16.

Beih. Bot. Centralb. 1912, pp. 51–54; Myk. Centralb. iii, p. 277.

Dimerium Gymnosporiæ (P. Henn.), Syd. Ann. Myc. vii (1909), p. 546; Trans. Roy. Soc. of S. Af. v, Part vi, p. 719, Pl. lviii, f. 7.

Dimerosporium Gymnosporiae P. Henn. Syll. Fung. xvi, p. 408.

Epiphyllous or amphigenous, sub-crustaceous; mycelium pale fuscous, radiating, effuse, hyphae 7–11 μ thick, sinuous, septate, with a few small hyphopodia; hyphopodia sessile, 1–celled, hemispherical. Thyriothecia gregarious, hemispherical, black, opaque, 90–110 μ diam. Asci ovoid, rounded at the apex, sub-tunicated, attenuated at the base, sometimes very briefly pedicellate, 35–50 × 30–45 μ, 8-spored, paraphysate. Spores conglobate, ovoid, 1-septate, constricted, fuscous, 18–24 × 10–13 μ.

On leaves of *Gymnosporia* sp., Umbelusi, Portuguese East Africa, Howard, 523; Empangeni, Natal, 11/7/17, v. d. Bijl, 11367.

On *Putterlickia*, sp. Isipingo, Natal, 21/5/15, Doidge, 10154.

2. **Englerulaster Popowiae** Doidge, sp. nov.

Plate XIII, fig. 1. Slide XLV, 6.

Epiphyllous, forming thin black spots up to 5 mm. diam.; mycelium brown, radiating; hyphæ 5–6 μ thick, frequently septate; branching opposite or irregular; hyphopodia sessile, alternate or unilateral, occasionally opposite, capitate to ellipsoid, some at right angles to the hyphae, others bent or curved inwards, broadening at the base, 10–13·5 × 6–8 μ, sometimes up to 16 μ in length. Thyriothecia dark brown but seldom quite opaque, 160–190 μ diam., radiating hyphae 5–6 μ thick, margin coarsely fimbriate, dehiscence by an irregular central fissure which extends outwards to the margin and leaves the ripening asci exposed. Asci spherical to ovate, 8-spored, apedicellate, not tunicated, often slightly angular by compression, 40–47 × 30–40 μ, aparaphysate. Spores brown, 2-celled, constricted, cells equal or upper loculus slightly larger, each loculus almost spherical, minutely scabrous when mature, 21–27 × 10–13·5 μ.

On leaves of *Popowia caffra*, Buccleuch, Natal, 24/3/16, Doidge, 9714; East London, 24/11/17, Doidge, 10917.

3. **Englerulaster orbicularis** (B. & C.) v. Höhn.

Fragmente z. Myk. 520, Sitz. Ber. k. Akad. d. Wiss. math.-nat. Klasse.

Asterina orbicularis B. & C., Grevillea, iv, p. 8; Syll. Fung. i, p. 46; on living leaves of *Ilex coriacea*, Florida, Rabh.-Wint. Fung. Eur. 3439.

Dimerosporium orbiculare Mart., Journ. of Myc. i, p. 146; Ell. & Ev. North American Pyrenomycetes, p. 32.

Plate XIII, fig. 2. Slides XVI, 1, 2; XXIII, 13–16; XXIV, 1, 10; XLII, 11–13.

Amphigenous, forming black, crustaceous spots, 3–5 mm. diam.; when numerous they become confluent and produce irregular, black blotches covering large areas of the leaf surface. Mycelium radiating, branching and anastomosing freely; hyphae brown, straight, 5–6 μ thick, branching opposite or alternate; cells 10–15 μ long; hyphopodia alternate or opposite, sessile, hemispherical, flattened or shortly cylindrical, 5–8 × 5–6 μ. Thyriothecia scattered, hemispherical, opaque, 150–170 μ diam., radiating cells 3–3·5 μ thick, cells cubical, margin not fimbriate, but the thyriothecia are surrounded by a dense network of hyphae. Asci aparaphysate, 8-spored, broadly ovate or sub-spherical, 54–57 × 44–50 μ, much thickened round the apex. Spores conglobate, 2-celled, brown, slightly constricted, 33–36 × 15–18 μ, cells equal or subequal, epispore minutely verrucose at maturity. Pycnidia similar to the thyrothecia but smaller, 60–120 μ diam.; conidia brown with a hyaline band, oval or ovate, 15–25 × 8–14 μ.

On leaves of *Ilex capensis*, Woodbush, Zoutpansberg, 4/8/11, Doidge, 1753; Brander's High Forest, Victoria East, 14/8/15, v. d. Bijl, 9461; Zwartkop, Natal, 15/8/17, T. R. Sim, 10574; Van Staden's Pass, 13/11/17, Doidge, 10884; Woodville Forest, George, 11/11/17, Doidge, 10943; Buccleuch, Natal, 17/7/18, Doidge, 11563.

Parasterina Theiss. et Syd.

Ann. Myc. xvii (1915), p. 246.

Like *Asterina*, but asci paraphysate.

Hyphopodia sessile.

a. Spores 35–40 μ long . . . . . 1. *P. implicata*.

b. Spores not more than 35 μ long.

x. Hyphopodia never opposite . . . 2. *P. Brachystoma*.

xx. Hyphopodia usually opposite . . . 3. *P. rigida*.

1. **Parasterina implicata** Doidge, sp. nov.

Plate XIII, fig. 3. Slide XXXIII, 2.

Epiphyllous, forming round-irregular, black, crustaceous spots 3–5 μ diam. Hyphae brown, 6–7 μ thick, torulose, branching irregularly and anastomosing freely to form a network of entangled hyphae, tips of branches often club-shaped; cells 14–25 μ long; hyphopodia sessile, not very numerous, alternate or unilateral, hemispherical, ovate or obliquely flattened, 6–10 × 10–6 μ. Thyriothecia gregarious, flattened-hemispherical, 300–400 μ diam., composed of radiating hyphae 3·5–5 μ thick, dehiscence irregular or stellate. Asci ovate to spherical, 8-spored, paraphysate, slightly thickened round the apex, 57–73 × 50–57 μ; paraphyses numerous, filiform. Spores conglobate, 2-celled, fuscous, smooth, constricted, 35–40 × 13–15 μ, upper cell broader.

On leaves of *Sideroxylon inerme*, East London, 24/11/17, Doidge, 10922.

2. **Parasterina brachystoma** (Rehm.) Th.

Die Gattung Asterina, p. 49.

Seynesia brachystoma Rehm., Hedwigia, 1898, p. 325; Syll. Fung. xvi, p. 641, on leaves of a tree, Serra do mar, Central Brazil; Ule 569 Herb. Pazschke and Berlin, on Myrtaceae leaves, Ule 1238; Herb. Berlin sub *Seynesia colliculosa* Rehm.

Asterina multiplex Rehm., Ascom. 1706. On living leaves of *Styrax leprosum*, São Leopoldo, Rio Grande do Sul, South Brazil; Theissen, Decades F. Bras. 59.

Asterina megalosperma Speg. in herb; on leaves of *Styrax*?, Ipiranga no. 16.

Also Ule 1143, Herbar. Pazschke, on an Anonaceae sub *Asterina paraguayensis*.

Plate XIII, fig. 4. Slides XXVI, 16; III, 7–9: XXXV, 11.

Epiphyllous, forming black, carbonaceous spots, round to irregular, up to 10 mm. diam. Mycelium radiating, branching alternately and anastomosing to form a network; hyphae straight, brown, 6–8 μ thick, frequently septate, cells 10–16 μ long, walls often oblique; hyphopodia alternate, sessile, continuous, very briefly cylindrical or subglobose, 7–11 × 6–10 μ. Thyriothecia hemispherical, gregarious, 280–400 μ diam., consisting of straight, brown hyphae about 3 μ thick, cells almost cubical; dehiscence stellate; margin dentato-crenulate, certain stout hyphae running out into the mycelium. Asci paraphysate, broadly ovate, sessile, thickened at the apex, about 55 × 45 μ, 8-spored; paraphyses filiform, swollen at the tips, which become conglutinate. Spores conglobate, brown, smooth, oblong, 2-celled, slightly constricted, rounded at both ends, 30–35 × 14–17 μ (Thiessen makes the spores 33–37 μ long), cells equal in length, but the upper loculus somewhat broader.

On leaves of *Eugenia Zeyheri*, Woodbush, Zoutpansberg, 3/8/11, Doidge, 1759; March, 1910, Gray, 888.

On *Eugenia Gerrardi*, Buccleuch, Natal, 23/3/16, Doidge, 9723; 20/4/16, J. M. Sim, 10141.

On shrub undetermined (*Myrtaceae*?), Zwartkop, Natal, 19/7/18, Doidge, 11597.

var. **Laxa** Doidge, var nov.

Slides XXVI, 17, 18; XXXIX, 7.

Mycelium more slender and more opaque than in the type; hyphopodia more distant and slightly smaller.

On leaves of *Grumilea capensis*, Woodbush, Zoutpansberg, 3/8/11, Doidge, 1758.

On *Oxyanthus Gerrardi*, Berea, Durban, 28/1/17, v. d. Bijl, 11017.

On *Oxyanthus natalensis*, Berea, Durban, 28/1/18, v. d. Bijl, 11366.

3. **Parasterina rigida** Doidge, sp. nov.

Slide XXXVIII, 12. Plate XIII, fig. 5.

Epiphyllous, forming black, carbonaceous spots up to 7 mm. diam., mostly on the primary veins. Hyphae brown, 5–6 μ thick, branches mostly alternate, anastomosing; cells 16–20 μ long; hyphopodia numerous, usually opposite, sessile, hemispherical to ovate, 6–8 × 5–6 μ. Thyriothecia gregarious, flattened-hemispherical, 250–400 μ diam., formed of radiating hyphae about 5 μ thick, dehiscing by an irregular disruption of the central cells. Asci paraphysate, broadly elliptic to ovate, 60–75 × 30–40 μ, thickened round the apex, which is traversed by a pore; paraphyses filiform, somewhat swollen at the tips and not so long as the asci. Spores conglobate, fuscous, 2-celled, constricted, 27–33 × 13–15 μ, upper loculus larger than the lower. On leaves of *Oncinotis inandensis*, Buccleuch, Natal, 11/5/16, Doidge, 9722.

Asterina Lév.

Ann. d. Sc. natur., Sér. iii (Bot.), Bd. iii, 1845, p. 59.

Mycelium superficial, branched, septate, with regular hyphopodia or node-cells. Thyriothecia flat to hemispherical, inverse, radial-prosenchymatous in structure, without a regular ostiole; spores escape through fissures in the thyriothecial membrane. Asci aparaphysate. Ascospores brown, 2-celled. Pycnidia similar to the thyriothecia, pycnoconidia brown, 1-celled (Asterostomella); mycelial conidia 1-celled or wanting.

Key to the Sections.

A. Thyriothecia without basal membrane . Sub-genus I—Dimerosporium.
B. Thyriothecia with basal membrane . Sub-genus II—Clypeolaster.

Sub-genus I. Dimerosporium Fckl.

1869. Sym. Myc., p. 89; (*Myxasterina*) v. Höhn. Fragm. z. Myk., no. 331 (vii, p. 58), 1909.

Thyriothecia without basal membrane, asci aparaphysate.

A. *Nodulosae:* hyphae without true hyphopodia, but with swollen node-cells.
  a. Nodes 7–10 μ diam. . . . . 3. *A. gibbosa* var. *megathyria.*

B. *Hyphopodiatae:* hyphae with true hyphopodia.
  a. Hyphopodia 2-celled.
    1. Spores verrucose or ciliate.
      i. Spores 15–19 μ long, thyriothecia 120–130 μ diam. . . . . 4. *A. natalensis.*
      ii. Spores 18–23 μ long, thyriothecia 140–180 μ diam. . . . . 5. *A. Combreti.*
      iii. Spores 23–28 μ long . . . . 6. *A. Peglerae.*

2. Spores smooth.
   i. Spores 15–18 μ long . . . . 5. *A. tenuis.*
   ii. Spores 18–24 μ long.
      x. Thyriothecia 130–150 μ diam. . 6. *A. fimbriata.*
      xx. Thyriothecia 160–240 μ diam. . 7. *A. reticulata.*
   iii. Spores 30–34 μ long . . . . 8. *A. uncinata.*

b. Hyphopodia 1-celled.
1. Hyphopodia entire or with slight indentations, not deeply lobed.
   i. Hyphopodia angular or sub-lobed . 9. *A. delicata.*
   ii. Hyphopodia finger- or flask-shaped.
      x. Spores smooth . . . . 10. *A. Grewiae.*
      xx. Spores minutely verrucose . . 11. *A. Trichiliae.*
   iii. Hyphopodia hemispherical or shortly and broadly cylindrical.
      x. Spores 15–18 μ long . . . 12. *A. raripoda.*
      xx. Spores 23–26 μ long.
         o. Thyriothecia dehiscing by a stellate fissure . . . 13. *A. ferruginosa.*
         oo. Thyriothecia dehiscing by an irregular spherical rupture.
            /. Thyriothecia 225–280 μ diam., radiating hyphae straight . . . 14. *A. rhamnicola.*
            //. Thyriothecia 150–200 μ diam., radiating hyphae tortuous . . . 15. *A. Hendersoni.*
      xxx. Spores 26–28 μ long . . . 16. *A. opaca.*
      xxxx. Spores 35–40 μ long . . . 17. *A. robusta.*
2. Hyphopodia lobed.
   i. Spores verrucose.
      x. Spores 20–23 × 10–12 μ . . 18. *A. erysiphoides.*
      xx. Spores 17–22 × 8–10 μ . . 19. *A. Balansae* var. *africana.*
      xxx. Spores 23–27 × 12–13·5 μ . . . 20. *A. Excoecariae.*
   ii. Spores smooth.
      x. Spores 13–15 μ long . . . 21. *A. undulata.*
      xx. Spores 16–20 μ long . . . 22. *A. polythyria.*

3. **Asterina gibbosa** Gaill.

Bull. Soc. Myc. 1897, p. 180; Syll. Fung. xiv, p. 697; Die Gattung Asterina, p. 57, T. lv, fig. 7, v, 3–4, vii, 29–30, viii, 3, Rabh. W.P.F. eur. 4054, Tuberao, Sta. Catharina, South Brasil; Balansa, Plantes

du Paraguay 3839 (Herb. Kew) on *Randia* sp., Guarapi, Brasil; on *Basanacantha spinosa*, São Leopoldo, Rio Grande do Sul, Herb. Theissen.

var. **megathyria** Doidge, var. nov.

Plate XIII, fig. 6. Slides XI, 16–19; XIII, 10; XXXI, 15; XXXII, 16, 17; XXXIV, 4; XLI, 7.

Mostly epiphyllous, forming minute, orbicular, black, crustaceous spots, 1–3 mm. diam; when the spots are hypophyllous they frequently become confluent. Mycelium not effuse, irregularly branched; hyphae flexuous, 4–6 μ thick, radiating, olivaceous-brown; cells 10–20 μ long; nodes 7–10 μ thick, asymmetrical, more or less spherical. Thyriothecia very numerous, densely aggregated and becoming confluent, flattened-hemispherical, outline orbicular or flattened by contact, 140–200 μ diam., composed of straight, radiating hyphae 2–4 μ thick, cells 4–6 μ long; margin not fimbriate, dehiscence stellate. Asci aparaphysate, ovate to sub-clavate, 8-spored, thickly tunicated, especially round the apex, 33–34 × 27–33 μ. Spores ellipsoid, 1-septate, slightly constricted, light olivaceous brown, smooth, 16–20 × 8–9 μ; upper loculus sub-spherical, 8–9 μ diam.; lower loculus ellipsoid, 9–12 × 8 μ.

On *Tricalysia Sonderiana*, nr. Durban, 25/5/1897, Wood (Wood No. 6452 sub. *A. tenuis*).

On *Tricalysia lanceolata*, Amanzimtoti, 10/7/11, Doidge, 1576; Winters Kloof, 27/6/11, 1/6/15, Doidge, 1624, 8987; Claridge, 31/5/15, Doidge, 8992; Kentani, 16/12/14, Pegler (Pegler, 1970), 8787.

On *Randia dumetorum*, Amanzimtoti, 10/7/11, Doidge, 1682; Lemana, Zoutpansberg, 14/8/11, Doidge, 1792; Umgeni, Durban, 10/7/15, Wood, 9031.

On *Pavetta obovata*, Krantzkloof, Natal, 26/5/15, Doidge, 8985.

On *Alberta?* sp., Buccleuch, Natal, Doidge, 10151.

On *Plectronia Guienzii*, Hogg's Back, 15/1/18, J. & M. Henderson, 11347.

Differs from the type in the size of the asci and thyriothecia; the latter are much larger and the radiating hyphae composing the thyriothecial membrane narrower than in the type. The specimens from South Brazil have very small thyriothecia, 50–90 μ diam., with radiating hyphae 4–5·5 μ thick.

This species occurs very commonly on *Rubiaceae*, and has been collected a number of times, especially in Natal.

2. **Asterina natalensis** Doidge, sp. nov.

Plate XIII, fig. 7. Slide XXXI, 11.

Epiphyllous, forming thin black spots 2–4 mm. diam.; mycelium slender, branching irregularly and anastomosing; hyphae 3–5 μ thick, hyphopodia fairly numerous, alternate or occasionally opposite, stipitate, 2-celled, upper

cell slightly lobed or hooked, 8–14 × 6–10 μ. Thyriothecia 120–130 μ diam., flattened-hemispherical; margin fimbriate; dehiscence stellate; composed of radiating hyphae 3–3·5 μ thick, cells almost cubical, about 4 μ long. Asci aparaphysate, broadly cylindrical or spherical, somewhat thickened round the apex, 26–32 × 20–24 μ. Spores conglobate, 2-celled, constricted, 15–19 × 9–10 μ, brown, upper loculus slightly broader; epispore very minutely scabrous at maturity. Pycnidia similar to the thyriothecia but slightly smaller; conidia ovate, brown with a lighter medial band, 13–17 × 8–10 μ.

On leaves of *Mikania* sp., Winkle Spruit, Natal, 28/5/15, Doidge, 9001.

3. **Asterina Combreti** Syd.

Engl. Bot. Jahrb. 1910, p. 264, on leaves of *Combretum tavatense*, Kibwezi, British East Africa; Herb. Syd. and Berlin, Die Gattung Asterina, p. 63, pl. iii, fig. 8; vii, 7.

Hyphaster kutuensis (P. Henn.) in H. Baum, Ber. der Kunene-Zambesi-Exped. 1902, p. 169.

Asterina (*Dimerosporium*) *kutuensis* (P. H.) v. Höhn., Fragm. z. Mykol. xii, no. 599, on *Combretum Baumii*, East Africa.

Asterina Combreti var. *kutuensis* (P. Henn.) v. Höhn., Die Gattung Asterina, p. 63.

Plate XIII, fig. 8. Slides XXIII, 19, 20; XXXI, 16; XXXIII, 16.

Amphigenous, mostly epiphyllous, forming orbicular or indefinite spots 2–6 mm. diam.; mycelium delicate, undulating; hyphae light brown, branching irregularly and anastomosing, 3–4·5 μ thick, less frequently up to 5 μ thick, cells 16–20 μ long; hyphopodia alternate briefly stipitate, 8–14 × 4–5 μ, upper cell slightly lobed or curved. Thyriothecia gregarious, flattened-hemispherical, 140–180 μ diam., composed of radiating hyphae about 3 μ thick, cells rectangular 4–7 μ long, the central ones almost cubical, cells longer towards the fimbriate margin; dehiscence stellate. Asci globose-ovate, 28–40 × 28–32 μ, 8-spored, aparaphysate. Spores conglobate, oblong, rounded at both ends, 1-septate, constricted, brown, 18–23 × 8–11 μ, upper loculus frequently somewhat broader, epispore minutely verrucose at maturity. Pycnidia resembling the thyriothecia but smaller; conidia (*Asterostomella*) elliptical to pear-shaped, continuous, brown with a medial, hyaline band, 18–24 × 9–13 μ.

On leaves of *Combretum Kraussii*, Woodbush, Zoutpansberg, 3/8/11, Doidge, 1773; Buccleuch, Natal, 20/4/16, J. M. Sim, 10152; Stella Bush, Durban, 19/4/18, Bottomley, 11378; Buccleuch, 23/3/16, Doidge, 9709.

On *Combretum*, sp., Winkle Spruit, Natal, 28/5/15, Doidge, 9004; Rikatli, Portuguese East Africa, Sept., 1918, Junod, 11731, 11732; Louis Trichardt, Transvaal, 8/4/19, Putterill, 11829.

Theissen (Die Gattung Asterina, p. 63) describes *A. Combreti* Syd. with hyphae 4–5 μ thick, hyphopodia 8–10 μ long and spores 20–24 × 9–11 μ;

var. *kutuensis* (P. Henn.) v. Höhn. is distinguished from the type by its hyphae 3–3·5 μ thick, hyphopodia 10–13 μ long and spores 18–20 × 8–9 μ. Theissen had not seen the type specimen of *A. kutuensis*, but quoted von Höhnel's original description. I am unable to distinguish between these two forms; the spores vary from 18–23 μ in length and from 8–11 μ in breadth; sometimes the mycelium is fairly stout, 4–5 μ thick, with rather short hyphopodia (8–10 μ long); in other cases the mycelium is more slender, 3–3·5 μ thick, with hyphopodia 10–13 μ long. Not infrequently all these characters can be met with on one leaf, and there is, within the limits indicated, considerable variation in the dimensions of the hyphae, hyphopodia and spores. I have therefore included all the collections examined in the species *A. Combreti* without attempting to distinguish varieties.

4. **Asterina Peglerae** Doidge, sp. nov.

Plate XIII, fig. 9. Slide XI, 20.

Hypophyllous, forming thin, spreading black areas of irregular form. Hyphae fuscous, very slender, 3·5–4 μ thick, branching irregularly and anastomosing; hyphopodia alternate or unilateral, 10–15 × 6–10 μ, stipitate, stipe usually cylindrical, equal in thickness to the hyphae, and from 3–10 μ long, but occasionally septate or gibbous (see *A. peraffinis*), terminal cell irregularly 2–3-lobed, and frequently uncinate. Thyriothecia numerous, scattered, light brown, flattened-hemispherical, 110–160 μ diam., composed of radiating hyphae 2·5–3 μ thick; these are not straight but more or less undulating; margin fimbriate; dehiscence irregular, then stellate. Asci aparaphysate, sub-spherical, 45–50 × 43–45 μ, 8-spored. Spores conglobate, 2-celled, constricted, upper loculus larger, very opaque when mature, epispore ciliate, 23–28 × 13–16·5 μ.

On leaves of *Rhus*? sp., Kentani, 6/9/15, Pegler (Pegler, 2354), 9130.

The determination of the host is uncertain as Miss Pegler has never found this plant in flower. It is a small shrub with trifoliate leaves.

The hyaline spores in the immature ascus of this species of *Asterina* are quite smooth, but on the spores which are just turning colour there are often bristles up to 3 μ long; the epispore is pronouncedly ciliate at maturity, but never has bristles so long as those on the ripening spore.

5. **Asterina tenuis** Wint.

Hedwigia, 1886, p. 94; Syll. Fung. ix, p. 389; Die Gattung Asterina, p. 116.

Plate XIV, fig. 10. Slides XVI, 17–20; XXIX, 7–8; XXXI, 20; XXXIV, 5–7; XXXVI, 2–5.

Amphigenous; mycelium effuse; hyphae light brown, very slender, anastomosing; hyphopodia alternate, mostly stipitate but some sessile

8–20 × 7–10 μ, distinctly 3–6-lobed, some almost palmate, others somewhat uncinate. Thyriothecia gregarious, often becoming angular through contact, otherwise flattened-hemispherical, fuscous, 85–130 μ diam., composed of radiating hyphae 2–3 μ thick, cells about 4 μ long; margin fimbriate, dehiscence stellate. Asci almost globose, sessile, 8-spored, 30–35 × 26–32 μ. Spores oblong, 1-septate, constricted, rounded at both ends, not infrequently asymmetrical, fuscous, 15–18 × 7–9 μ, lower loculus slightly narrower. Pycnidia similar to the thyriothecia but slightly smaller; conidia (*Asterostomella*), oval to pyriform, fuscous with a hyaline medial band, 13–18 × 6–10 μ.

On leaves of *Claoxylon* sp., Natal, Wood (Wood, 6458 *b*), 1534 *b*.

On *Dalechampia capensis*, Amanzimtoti, Natal, 10/7/11, Doidge, 1638; Winkle Spruit, Natal, 25/5/15, Doidge, 9003.

On *Acalypha decumbens*, Van Stadens Pass, 13/11/17, Doidge, 10862.

The type specimen (Wood 6458), consists of two different sets of leaves. The fungus on the leaves of *Claoxylon* sp. corresponds with Winter's description of *A. tenuis*; the other leaves are apparently those of a *Capparis* sp., and the fungus, which is in very poor condition, resembles *A. celtidicola* var. *microspora*.

Evidently two sets of specimens have been confused, and this accounts for the fact that Theissen (Die Gattung Asterina), failed to find a species corresponding to *A. tenuis* on Wood's no. 6458.

6. **Asterina fimbriata** Kalch. & Cke.

Grevillea, ix, p. 33 c. tab. 138, f. 46; Syll. Fung. i, p. 41.
Asterina punctiformis Lév. var. *fimbriata*, Die Gattung Asterina, p. 67, T.V., fig. 19.

Plate XIV, fig. 11. Slides V, 6; XXIV, 20; XXV, 4.

Epiphyllous, mycelium radiating, irregularly branched, but branches frequently opposite and anastomosing very irregularly; hyphae light brown, undulating, 4–6 μ thick; hyphopodia alternate, stipitate, 8–12 × 6–8 μ, stipe cell short, terminal cell capitate or club-shaped, and usually slightly indented or 2–3-lobed. Thyriothecia gregarious, round, 130–170 μ diam., or oval, 170 × 140 μ; composed of radiating hyphae 3·5–4·5 μ thick, cells 7–10 μ long; margin fimbriate, dehiscence stellate. Asci aparaphysate, 8-spored, ovate-spherical, 28–34 μ diam., or 36–48 × 26–28 μ. Spores conglobate, 1-septate, rounded at both ends, brown, deeply constricted, 18–22 × 8–10 μ, loculi sub-equal, or the upper loculus slightly broader.

On leaves of *Sclerochiton harveyanus*, nr. Uitenhage, MacOwan (MacOwan, 1290); East London, 24/11/17, Doidge, 10910.

On *Hypoestes* sp., Wood, Natal (Wood, 608).

On *Plectronia ciliata*, East London, 24/11/17, Doidge, 10900.

7. **Asterina reticulata** Kalch. & Cke.

Grevillea, ix, p. 33; Syll. Fung. i, p. 40.
Asterostomella reticulata (K. & Cke.) v. Höhn., Fragm. z. Myk. 493.
Plate XIV, fig. 12. Slides XXVI, 7–8.

Amphigenous, forming black, carbonaceous, sub-orbicular spots; or spreading, chiefly along the veins and leaf margins. Mycelium spreading, reticulate; hyphae light brown, 5–6 μ thick, straight, cells 15–30 μ long; branches usually opposite, anastomosing; hyphopodia alternate or unilateral, briefly stipitate, club-shaped, hooked or slightly lobed, 7–13 × 6–8 μ. Thyriothecia flattened-hemispherical, composed of radiating hyphae 3-3·5 μ thick, cells 3·5–4 μ long, cubical; margin fimbriate, dehiscence irregular-stellate. Asci ovate, sessile, aparaphysate, 45–50 × 30–33 μ. Spores conglobate, 1-septate, constricted, brown, smooth, 20–23 × 10 μ; loculi sub-equal or upper loculus slightly broader, each cell almost spherical. Pycnidia similar to the thyriothecia but smaller, 100–150 μ diam.; conidia brown with a medial hyaline band, ellipsoid or pyriform, 16–20 × 7–10 μ.

On leaves of *Olinia cymosa*, Boschberg, Cape Province, 1877, MacOwan (MacOwan, 1336, Rabh.-Wint. Fung. Eur. 3337), *Asterostomella* stage only.

On *Olinia* sp., Barberton, 18/1/91, Galpin (Galpin, 1275).

MacOwan's specimen shows only the conidial stage, and was on that account referred by v. Höhnel to the genus *Asterostomella*. I have not succeeded in collecting this fungus myself but was fortunate in finding the thyriothecia and ascospores on a specimen of *Olinia* in the Galpin herbarium.

8. **Asterina uncinata** Doidge, sp. nov.

Plate XIV, fig. 13. Slides X, 15–16.

Hypophyllous, effuse; mycelium light brown, delicate, branching irregularly and anastomosing; hyphae undulating, 5–6 μ thick, cells 26–33 μ long; hypopodia alternate, unilateral or opposite, stipitate, 20–40 μ long, stipe 1–3-celled, 7–30 μ long, cylindrical, equal in thickness to the hyphae, straight, curved, or abruptly geniculate, occasionally bearing two terminal cells; terminal cell club-shaped or cylindrical, straight or unciuate, the curve being in the same direction as, or in the opposite direction to that of the stipe, occasionally sub-lobed. Thyriothecia large, rather pale and covered with a network of hyphae, flattened-hemispherical, 200–280 μ diam., composed of radiating hyphae 3–5 μ thick—these are straight except at the margin, where they become tortuous; cells 3·5–7 μ long; dehiscence by a central pore, which developes into a stellate fissure; margin not fimbriate. Asci aparaphysate, spherical or ovate, 42–50 × 40–45 μ. Spores smooth, dark brown, opaque, 30–34 × 16–20 μ, deeply constricted; each loculus ovoid; upper loculus 18–20 μ broad, lower loculus 14–16 μ broad.

On leaves of *Rhamnus prinoides*, Brander's High Forest, Victoria East, 12/8/15, v. d. Bijl, 9463; on the same leaves as *A. rhamnicola*.

12. **Asterina delicata** Doidge, sp. nov.

Plate XIV, fig. 14. Slide XXXI, 10.

Epiphyllous, effuse, forming thin blackish spots up to 8 mm. diam. Mycelium spreading, delicate; hyphae slender, light brown, 3–3·5 μ thick, cells 20–24 μ long, branching irregular; hyphopodia alternate, 1-celled, asymmetrical, usually angular or sub-lobed, 6–7 μ high by 6–10 μ broad. Thyriothecia gregarious or scattered, flattened-hemispherical, 100–130 μ diam., composed of radiating hyphae 3 μ thick, cells almost cubical, 3–3·5 μ long; margin not markedly fimbriate; dehiscence at first by a central pore, then irregular. Asci aparaphysate, sessile, ovate or spherical, 26–33 × 33–40 μ. Spores conglobate, light brown, 1-septate, constricted, broadly rounded at both ends, 20–22 × 10–12 μ, cells sub-equal, or upper loculus slightly broader. Pycnidia similar to the thyriothecia but smaller, 70–100 μ diam. Conidia dark brown, continuous, elliptical to ovate, 20–22 × 12–15 μ.

On leaves of *Trimeria alnifolia*, Mayville, Durban, 22/7/15, Wood, 9062.

10. **Asterina Grewiae** Cke.

Grevillea, x, p. 130; Ann. Myc. x, p. 189; Die Gattung Asterina, p. 76.

Plate XIV, fig. 15. Slides XXVI, 13; XXIX, 13; XXXIII, 1.

Amphigenous, mostly epiphyllous; mycelium effuse, delicate, irregularly branched, and anastomosing to form a network; hyphae slender, light brown, 3·5–4 μ thick, undulating; cells 15–20 μ long; hyphopodia alternate, unilateral or occasionally opposite, 1-celled, finger or flask-shaped, sometimes sub-lobed, 8–10 × 3·5–4 μ. Thyriothecia numerous, flattened-hemispherical, 100–130 μ diam., formed of radiating hyphae about 3 μ thick, with cells 3–5 μ long; margin not fimbriate; dehiscence by an irregular-stellate fissure. Asci aparaphysate, 8-spored, spherical, 20–24 μ diam. Spores conglobate, brown, 1-septate, smooth, constricted, 20–22 × 10–12 μ, upper loculus broader and almost spherical. Pycnidia similar to the thyriothecia but smaller, 50–65 μ diam.; conidia continuous, ovate-elliptical, rounded at both ends, 18–20 × 11–13 μ, brown without medial band.

On leaves of *Grewia lasiocarpa*, Inanda, Natal, 1879, Wood (Wood, 639); Kentani, 25/8/17, Pegler (Pegler, 2436), 10993; Woodville Forest, George, 11/11/17, Doidge, 11018.

11. **Asterina Trichiliae** Doidge, sp. nov.

Plate XIV, fig. 16. Slides XXXIV, 11; XLVII, 11.

Epiphyllous, forming thin, scattered, sub-circular spots up to 6 mm. diam. Hyphae brown, straight, 4–6 μ thick, branches opposite, anastomosing, often at right angles to the hyphae; hyphopodia frequently opposite,

finger- or flask-shaped, sessile, 6–10 × 4–5 μ. Thyriothecia scattered, flattened-hemispherical, 190–220 μ diam., formed of radiating hyphae 3–3·5 μ thick, opaque in the centre, more translucent towards the fimbriate margin; dehiscence stellate. Asci aparaphysate, 8-spored, ovate or sub-spherical, 40–46 × 43–50 μ, embedded in a yellowish mass of mucilaginous matter. Spores conglobate, 1-septate, constricted, 25–27 × 12–13 μ, dark brown, opaque when mature and minutely scabrous, upper loculus slightly broader.

On leaves of *Trichilia dregeana*, Winkle Spruit, Natal, 28/5/16, Doidge, 9006.

On *Trichilia emetica*, Louis Trichardt, Zoutpansberg, 8/4/19, Putterill, 11833.

12. **Asterina raripoda** Doidge, sp. nov.

Plate XIV, fig. 17. Slide XXIV, 9.

Epiphyllous, forming thin black spots 3–5 mm. diam.; mycelium poorly developed, branching irregularly and occasionally anastomosing; hyphae pale-fuscous, 3·5–5 μ thick, frequently septate and somewhat sinuous, cells mostly 10–15 μ long; hyphopodia rare, alternate, 1-celled, hemispherical, 4–5 μ high and 6–7 μ broad. Thyriothecia scattered or confluent in small groups, flattened-hemispherical, arising at the tips of secondary hyphae and at first fan-shaped, or, less frequently, medial and round from the start, 150–200 μ diam., at first papillate, then dehiscing by a stellate fissure; margin irregularly crenulate, but not fimbriate. Asci aparaphysate, cylindrical-clavate to ovate, not tunicated, 8-spored, 40–52 × 16–24 μ. Spores conglobate, 2-celled, brown, slightly constricted, smooth, 15–18 × 7–10 μ; upper loculus broader, spherical; lower loculus ellipsoid.

On leaves of *Ansellia africana*, Zululand, April 1913, Franks, 6687.

13. **Asterina ferruginosa** Doidge, sp. nov.

Plate XIV, fig. 18. Slides XXXIV, 1-2; XXXIX, 13.

Epiphyllous, forming thin, black, carbonaceous spots up to 8 mm. diam., frequently coalescing to form irregular blotches. Hyphae brown, slender, 4–6 μ thick, branches usually opposite, anastomosing, cells 23–27 μ long; hyphopodia alternate or unilateral, sessile, hemispherical or sub-globose, 6–8 μ high and 8–10 μ broad; there are occasional stipitate hyphopodia, chiefly in the neighbourhood of the thyriothecia; they are 2-celled, 12–13 × 6–7 μ, the stipe cell being about 6 μ long. Thyriothecia numerous, scattered, or confluent in small groups, flattened-hemispherical, 160–190 μ diam., ferruginous, formed of radiating hyphae 3–3·5 μ thick; margin densely fimbriate; dehiscence stellate. Asci aparaphysate, 8-spored, sub-spherical, 33–37 μ diam., embedded in a dirty yellow mass of mucilaginous matter. Spores conglobate, 1-septate, brown, slightly constricted, smooth, 23–26 × 11–12·5 μ; upper loculus slightly broader.

On leaves of *Cussonia umbellifera*, Woodbush, Zoutpansberg Dist., 3/8/11, Doidge, 1774.

On *Cussonia spicata*, Sea View, Durban, 1/10/17, v. d. Bijl, 11360.

14. **Asterina rhamnicola** Doidge, sp. nov.

Plate XV, fig. 19. Slides X, 14–18; XXXIII, 3.

Epiphyllous, forming thin, carbonaceous, more or less orbicular, spots up to 5 mm. diam. Mycelium delicate, radiating; hyphae straight, brown, 6–7 μ thick; branches alternate or opposite, anastomosing; cells mostly 25–30 μ long; hyphopodia alternate or unilateral, sessile, shortly and broadly cylindrical or sub-hemispherical, 6–10 × 6–7 μ. Thyriothecia not numerous, scattered, conico-hemispherical, paler than the mycelium, 225–280 μ diam., formed of radiating hyphae 3–5 μ thick; margin not fimbriate; dehiscence by the irregular rupture of the central cells. Asci aparaphysate, broadly elliptic to ovate, 8-spored, 45–50 × 23–33 μ. Spores conglobate, 1-septate, fuscous, slightly constricted, 23–25 × 9–12 μ, upper loculus larger.

On leaves of *Rhamnus prinoides*, Woodbush, Zoutpansberg, 4/8/11, Doidge, 1752; Kentani, 10/4/15, Pegler (Pegler, 2315), 9068; Brander's High Forest, Victoria East, 12/8/15, v. d. Bijl, 9463.

15. **Asterina Hendersoni** Doidge, sp. nov.

Plate XV, fig. 20. Slides XLVII, 16–17.

Amphigenous, forming black spots up to 3 mm. diam. Mycelium brown, branching irregularly and anastomosing. Hyphae 5–6 μ thick, tortuous, sub-torulose, very frequently septate, cells 6–8 μ long; hyphopodia hemispherical, or somewhat angular or flattened, alternate, 3·5–6 μ diam. Thyriothecia flattened-hemispherical, scattered, 150–200 μ diam., formed of rather tortuous, radiating hyphae about 3·5 μ thick; margin coarsely fimbriate; dehiscence by an irregular rupture of the central cells. Asci aparaphysate, 8-spored, broadly ellipsoid to ovate, sessile or very briefly pedicellate, 45–50 × 26–33 μ, do not stain blue with iodine. Spores brown, 1-septate, constricted, 23–25 μ long; each cell sub-globose; upper loculus 13–13·5 μ broad, lower loculus 10–11 μ broad. Pycnidia similar to the thyriothecia but smaller, 120–150 μ diam.; conidia brown with a medial hyaline band, ovate to ellipsoid, 23–27 × 10–13 μ.

On leaves of *Ilex capensis*, Hogg's Back, 15/1/18, J. & M. Henderson, 11341, 11342.

16. **Asterina opaca** Syd.

Ann. Myc. x, p. 38; Die Gattung Asterina, p. 113.

Plate XV, fig. 21. Slides XXIII, 12; XLII, 9.

Epiphyllous, forming black, orbicular spots 1–3 mm. diam. Hyphae

short, but very much branched and anastomosing, chestnut brown, 5–7 μ thick, very closely interwoven; hyphopodia small, sessile, 1-celled, rounded at the apex or rarely slightly attenuated, alternate or opposite, 9–11 μ long, 5–6 μ broad. Thyriothecia often 1 or 2 in each spot, in the larger spots as many as 10, hemispherical, 150–250 μ diam., dehiscing irregularly, black, opaque, somewhat fimbriate. Asci ovate to globose, slightly thickened at the apex, aparaphysate, 50–70 × 35–46 μ, 8-spored. Spores conglobate, ellipsoid, broadly rounded at both ends, septate, deeply constricted, cells equal, smooth, 26–28 × 13–14 μ.

On leaves of *Chrysophyllum natalensis*, Amanzimtoti, Natal, 10/7/11, Doidge, 1663.

On *Chrysophyllum* sp., Buccleuch, Natal, 10/7/18, Doidge, 11555.

17. **Asterina robusta** Doidge, sp. nov.

Plate XV, fig. 22. Slides VI, 15, 19, 20.

Epiphyllous, forming black, carbonaceous spots up to 5 mm. diam.; these are often so numerous as to become confluent and form irregular black areas on the leaf surface. Mycelium dark brown, radiating; hyphae 6–7 μ thick, some of the cells swollen, 9–10 μ thick; cells about 20 μ long; branches opposite or alternate, usually somewhat narrowed at junction with main hypha; hyphopodia usually unilateral, sometimes alternate, 1-celled sub-hemispherical, 6–6·5 × 6·5–7 μ. Thyriothecia numerous, 300–400 μ diam., crowded, flattened-hemispherical when solitary, but more frequently confluent in small groups and becoming angular by lateral compression, opaque, almost black; composed of radiating hyphae about 5 μ thick; dehiscence by an irregular fissure, the cells breaking away from the centre outwards. Asci 8-spored, obovate, 65–75 × 45–55 μ, thickened round the apex; there are no true paraphyses, but the asci are surrounded by a spongy tissue of small greenish yellow cells, which decompose into the dirty yellow mucilaginous mass in which the asci are embedded at maturity. Spores conglobate, 35–40 × 18–20 μ, very dark brown, 1-septate, constricted, smooth, upper loculus slightly broader, each cell sub-spherical.

On leaves of *Pittosporum viridiflorum*, Mossel Bay, 22/7/15, Pole Evans, 9066.

18. **Asterina erysiphoides** Kalch. & Cke.

Grevillea ix, p. 32, t. 137, fig. 12; Syll. Fung. i, p. 47; Ann. Myc. x, p. 16.

Plate XV, fig. 23. Slides XXIII, 17–18; XXXII, 11.

Epiphyllous, forming black, sooty spots up to 6 mm. diam. Mycelium spreading, delicate; hyphae brown, 3·5–5 μ thick, much branched and anastomosing freely; hyphopodia alternate, sessile, 1-celled, erect or hooked, irregularly 3–5-lobed, 7–13 μ high and 5–10 μ broad. Thyriothecia flattened-

hemispherical, sub-opaque, 120–130 μ diam., composed of radiating hyphae 3–3·5 μ thick, central cells almost cubical, about 4 μ long; dehiscence stellate, margin fimbriate. Asci aparaphysate, almost spherical, 30–34 μ diam. Spores brown, 1-septate, constricted, rounded at both ends, 20–23 × 10–12 μ, upper loculus broader, epispore verrucose at maturity. Pycnidia similar to the thyriothecia but smaller, 80–100 μ diam.; conidia ovate to pyriform, continuous, brown with an ill-defined, light, medial band, 16–20 × 10–14 μ.

On leaves of *Jasminum tortuosum*, MacOwan 1139. MacOwan's No. 1139 in the herbarium of the South African Museum, Capetown, is *Puccinia exhauriens* Thüm., and I could find on the leaves no trace of an *Asterina* mycelium. Theissen (Ann. Myc. x, p. 16) writes of the specimen in the Kew Herbarium: "Das Original enthalt eine unreife *Asterina* mit hell-braunlichem Myzel, dessen Hyphen 4–5 μ dick sind und abwechselnde 6–8 hohe, meist drei-lappige Hyphopodien tragen. Die unreifen Gehäuse enthalten noch keine Schläuche, nur braune, hyalin gegurtelte sog. Stylosporen von 18–20 μ Lange und 10–12 μ Breite ('sporidiis ellipticis, continuis, atrofuscis 18·20 × 10' in der Originaldiagnose) Die Art ist zu streichen." Two more recent collections on *Jasminum* spp., however, show abundant thyriothecia and mature spores, and as the mycelium and conidia correspond with the above description I have re-described *A. erysiphoides* from these.

On *Jasminum multipartitum*, Springfield, Natal, 14/7/15, Wood, 9018.

On *Jasminum angulare*, Kentani, 8/11/15, Pegler (Pegler, 1868), 9161.

On *Jasminum* sp., Alice, C.P., 18/11/17, Doidge, 11978.

19. **Asterina Balansae** (Speg.) Th.

Die Gattung Asterina, p. 88.

Seynesia Balansae Speg. F. Guar. i, No. 297; ii, No. 130; Syll. Fung. ix, p. 1065.

var. **africana** Sacc.

Hedwigia, 1899, p. (133); Syll. Fung. xvi, p. 640; Die Gattung Asterina, p. 88.

Plate XV, fig. 24. Slide XXIII, 4.

Epiphyllous, forming opaque black spots 3–5 mm. diam.; these are often so numerous that they coalesce. Mycelium dense, irregularly branched; hyphae brown, sinuous, 4–6 μ thick, cells 12–15 μ long; hyphopodia alternate or unilateral, sessile, lobed, 4 μ high and 7–8 μ broad. Thyriothecia flattened-hemispherical, 100–150 μ diam., composed of radiating hyphae 3–3·5 μ thick, dehiscence stellate or irregular. Asci aparaphysate, 8-spored, spherical, 25–40 μ diam., or ellipsoid, 28–45 × 18–24 μ. Spores conglobate, brown, 1-septate, constricted, 17–22 × 8–10 μ; the upper cell spherical and broader than the lower; epispore minutely verrucose at maturity.

On leaves of *Rubus rigidus*, Natal, Wood (Wood, 6464), 9507.

20. **Asterina Excoecariae** Doidge, sp. nov.

Plate XV, fig. 25. Slides XIII, 11; XXXIV, 3.

Amphigenous; thin, carbonaceous, not forming orbicular spots, but irregular areas up to 8 mm. diam. Mycelium effuse; hyphae delicate, rather pale, somewhat undulate, 3–3·5 μ thick, cells about 16 μ long, branches opposite, anastomosing; hyphopodia sessile, alternate, or unilateral, various in shape, usually with 2–3 broad lobes, 6–7 × 6–8 μ. Thyriothecia scattered, flattened-hemispherical, 100–120 μ diam., composed of radiating hyphae 2·5–3 μ thick; dehiscence stellate. Asci aparaphysate, evanescent, 8-spored, sub-spherical, sessile, about 35–40 μ diam. Spores conglobate, 1-septate, brown, constricted, 23–27 × 12–13·5 μ, the upper loculus larger; epispore scabrous at maturity. Pycnidia similar to the thyriothecia but smaller, 60–70 μ diam.: conidia ovate, brown, with or without lighter, but not hyaline, medial band, 20–24 × 13–17 μ.

On leaves of *Excoecaria* sp., Winkle Spruit, Natal, 28/5/15, Doidge, 9009.

21. **Asterina undulata** Doidge, sp. nov.

Plate XV, fig. 26. Slide XXXI, 12.

Epiphyllous, forming minute black spots 1–3 mm. diam. Hyphae pale-fuscous, undulating in more or less regular waves, 5–6·5 μ thick, not much branched, occasionally anastomosing, cells 18–22 μ long; hyphopodia alternate, 1-celled, broader than long, 5–6·5 μ high and 7–10 μ broad, irregularly lobed and cut, many almost palmate. Thyriothecia formed at the tips of secondary hyphae, the immature thyriothecia are fan-shaped; mature thyriothecia flattened-hemispherical, gregarious, often becoming slightly angular by contact; margin not fimbriate; radiating hyphae 2·5–3 μ thick, cells 4–6 μ long. Asci aparaphysate, 8-spored, slightly thickened round the apex, ovate, 20–24 × 17–20 μ. Spores conglobate, narrow-ovate, brown, 1-septate, constricted, 13–15 × 6–8·5 μ, broadly rounded at both ends, upper loculus slightly broader.

On leaves of *Viola abyssinica*, Woodbush, Zoutpansberg, 4/8/11, Doidge, 1769.

Near *A. Veronicae*, from which it differs in the size and form of the hyphopodia. In *A. Veronicae* there is a fairly broad sinus between the lobes; in the present species the lobes are closely folded together, so that only one wall is visible between the two. There is also a difference in the size of the spores.

22. **Asterina polythyria** Doidge, sp. nov.

Plate XV, fig. 27. Slide XXIV, 8.

Mostly epiphyllous, colonies black, crustaceous, 1–4 mm. diam. Mycelium forming a radiating fringe round the very numerous, closely-packed thyriothecia and pycnidia. Hyphae brown, sinuous, branches numerous, frequently

opposite and anastomosing; hyphopodia sessile, broader than long, lobed, most frequently 2–3-lobed, 5–7 μ high and 6–10 μ broad. Thyriothecia opaque, densely crowded, flattened-hemispherical, 150–170 μ diam., with stellate dehiscence; or oblong, 190–200 × 140 μ, dehiscing by a lineal fissure. Asci cylindrical-ovate, aparaphysate, 8-spored, 26–40 × 20–24 μ, slightly thickened round the apex. Spores conglobate, 1-septate, brown, slightly constricted, 16–20 × 67 μ, smooth, the upper loculus somewhat broader. Pycnidia similar to the thyriothecia but smaller, 65–120 μ diam.; conidia brown with a hyaline band, continuous, ovate to pyriform, 16–21 × 6–10 μ.

On leaves of *Osyridicarpus natalensis*, Tongaat, Natal, 12/9/13, v. d. Bijl, 6949.

Sub-genus II. Clypeolaster Th.

Die Gattung Asterina, p. 6.

Thyriothecia with basal membrane, asci aparaphysate. The basal membrane is a blue-grey or grey-green disk formed of radiating hyphae, and apparently reproduces the structure of the thyriothecial membrane.

A. Hyphopodia 2-celled.
- *a.* Stipe cell gibbous . . . . . 23. *A. peraffins.*
- *b.* Stipe cell cylindrical.
  - 1. Hyphopodia lobed, 9–14 μ high.
    - i. Spores 16–18 μ long . . . 24. *A. celtidicola* var. *microspora.*
    - ii. Spores 20–23 μ long . . . 25. *A. ? vagans.*
  - 2. Hyphopodia not lobed, 12–20 μ high . 26. *A. sphaerasca.*

Hyphopodia 1-celled.
- *a.* Hyphopodia not lobed . . . . 27. *A. loranthicola.*
- *b.* Hyphopodia lobed.
  - 1. Spores smooth . . . . . 28. *A. clausenicola.*
  - 2. Spores verrucose.
    - i. Spores 18–20 μ long . . . 29. *A. diplocarpa.*
    - ii. Spores 15–18 μ long . . . 30. *A. tertia* var. *africana.*

23. **Asterina peraffinis** Speg.

Fung. Puig. 355; Syll. Fung. ix, p. 392.

On living leaves of an *Asclepiadaceae*, Apiahy, São Paulo; Museo Nacional, Buenos Aires. On a similar host, São Leopoldo, Rio Grande do Sul, Herb. Theissen.

Asterina pseudopelliculosa Speg. var. *peraffinis* (Speg.) Th. Die Gattung Asterina, p. 104.

Plate XVI, fig. 28. Slides VIII, 15, 20, 18, 19.

Hypophyllous; mycelium slender, undulating, densely reticulate; hyphae

brown, 3·5–5 μ thick, branches opposite or alternate, anastomosing; hyphopodia alternate or unilateral, 2-celled, occasionally sessile, 1-celled, 10–15 × 8–12 μ, most frequently palmately 3–4-lobed and obliquely septate between the first and second lobes; thus the stipe cell is gibbous and the terminal cell has 2–3 blunt lobes. Thyriothecia 100–160 μ diam., hemispherical, dehiscing by an irregular central fissure, which later becomes stellate; composed of radiating cells, 3–3·5 μ diam., margin fimbriate. Asci aparaphysate, spherical to obovate, 30–50 × 25–30 μ, 8-spored. Spores conglobate, brown, oblong, 18–22 × 7–10 μ, upper loculus sub-globose, lower loculus narrower. Pycnidia similar to the thyriothecia but smaller, about 70 μ diam.; conidia continuous, brown without a hyaline band, ovate to pyriform, 17–20 × 6–10 μ.

On leaves of *Tylophora Flanagani*, Lemana, Zoutpansberg, 14/8/11, Doidge, 1804; Hoek-van-helbosch, Zoutpansberg, 7/1/06, Burtt Davy, 1228; Brander's High Forest, Victoria East, 14/8/15, v. d. Bijl, 9458.

Theissen (Die Gattung Asterina) makes this a variety of *A. pseudopelliculosa*, from which it differs in the 2-celled hyphopodia, on the grounds that in the Brazilian specimens of *A. peraffinis* 1-celled hyphopodia are also found. In my specimens 1-celled hyphopodia are rare or absent, and it appears to me that the fact that the majority of the hyphopodia are 2-celled is sufficient to separate this species from *A. pseudopelliculosa*, where they are constantly 1-celled. Theissen also mentions f. *africana* = *Asterina Strophanthi* P. Henn., Engl. Bot. Jahrb. 38, p. 125, on *Strophanthus hispidus*, Togo, Africa, Rehm. Ascom. 1624, Herb. Berlin. This form, which is not represented in the National Herbarium, has some 1-celled and some 2-celled hyphopodia, and is an intermediate form between *A. peraffinis* and *A. pseudopelliculosa*.

24. **Asterina celtidicola** P. Henn.

Hedwigia, 1905, p. 64; Syll. Fung. xvii, p. 846; Die Gattung Asterina, p. 94, on leaves of *Celtis* sp., Rio Jurua, Amazonas; Herbar. Berlin.

Var. **microspora** Doidge, var. nov.

Plate XVI, fig. 29. Slides XXIV, 9; XXXVI, 15; XL, 6; XLII, 3, 4.

Mostly epiphyllous; hyphae brown, undulate, 3·5–5 μ thick, with cells 20–24 μ long; branching irregularly to form a network of anastomosing hyphae; hyphopodia alternate, stipitate, straight or curved, the terminal cell lobed, 9–13 μ high and 6–10 μ broad. Thyriothecia 85–100 μ diam., hemispherical, dehiscence stellate, margin fimbriate; composed of radiating hyphae 3–3·5 μ thick, cells 4–5 μ long. Asci ovate to globose, 23–30 × 26–33 μ, aparaphysate, 8-spored, thickened round apex, not stained blue by iodine. Spores dark brown, epispore strongly echinulate, rounded at both ends, 2-celled, constricted, 16–18 × 8–9 μ, rarely 20 μ long, upper loculus

very slightly broader. Pycnidia similar to the thyriothecia but smaller, 70–100 μ diam., conidia brown with a medial hyaline band, continuous, oval to ovate, 14–20 × 8–10 μ.

On leaves of *Maerua* sp., Stella Bush, Durban, 1/7/14, Franks, 8405; Amanzimtoti, Natal, 10/7/11, Doidge, 1683.

On leaves of *Maerua pedunculosa*, Stella Bush, Durban, 7/4/18, Bottomley, 11376.

On *Oncoba Kraussiana*, Stella Bush, Durban, 23/9/17, v. d. Bijl, 11361; 8/4/18, Bottomley, 11382.

Var. *microspora* differs from the type, and also from var. *Capparidis* (*Asterina Capparidis* Syd. et Butler, Ann. Myc. 1911, p. 390, on leaves of *Capparis*, Madras, India; Butler, 1179, Herb. Sydow.) chiefly in the size of the spores and asci. Var. *Capparidis* differs from the type in the short cubical cells composing the thyriothecium, which are not so delicate as those of the type, and in the somewhat stouter mycelium, the hyphae being 4·5–5·5 μ thick. The spores resemble those of the type. Var. *microspora* agrees very closely with the type in the form of the mycelium, but differs in the size of the asci and spores.

25. **Asterina ? vagans** Speg.

Fung. Guar. no. 127; Syll. Fung. ix, p. 390; Die Gattung Asterina, p. 95.

Pl. XVI, fig. 30. Slides XI, 10, 15; XLIV, 18.

Epiphyllous, effuse; hyphae radiating, brown, about 5 μ thick, branches distant, often opposite, cells usually 25–30 μ long; hyphopodia alternate or unilateral, 9–14 × 8–11 μ, briefly stipitate, stipe cell 3·5–6 μ long, terminal cell asymmetrical, more or less hooked, most frequently unequally 2-lobed or 3-lobed. Thyriothecia scattered, flattened-hemispherical, 120–180 μ diam., margin fimbriate; dehiscence by a stellate fissure; composed of radiating hyphae 3–3·5 μ thick, central cells cubical, 3·5–4·5 μ long. Asci aparaphysate, embedded in a dirty-yellow mass of mucilaginous matter, ovate, 33–37 × 33–35 μ. Spores conglobate, brown, 2-celled, loculi sub-equal, slightly constricted, 20–26 × 10–13 μ, verrucose when mature. Pycnidia 50–60 μ diam.; conidia brown with an obscure medial band, oval to pyriform, 15–18 × 10–11 μ.

On leaves of *Rinorea ardisiaeflora*, Buccleuch, Natal, 20/5/15, Doidge, 9704; 17/7/18, Doidge, 11581.

This should perhaps be described as a variety of *A. vagans*, the hyphae composing the thyriothecium are somewhat more slender than the type, and the asci do not stain blue with iodine; but my material of this species is very scanty, and I hesitate to describe it as a distinct variety until I have examined further collections.

26. **Asterina sphaerasca** Thüm.

Fung. Austro-Afric. 119; Syll. Fung. i, p. 40; Die Gattung Asterina, p. 115. "On leaves of *Capparis Guienzii*, Olifants Hoek, Uitenhage Dist."

Plate XVI, fig. 31. Slides XXIII, 11; XXIV, 13.

Epiphyllous, effuse; mycelium brown, consisting of sinuous hyphae 5–6 μ thick, cells 24–30 μ long, branching irregular, hyphae anastomosing to form a network; hyphopodia 2-celled, not lobed, erect, straight or uncinate, opposite or alternate, 12–20 × 5–6 μ. Thyriothecia numerous, opaque, hemispherical, 130–170 μ diam., composed of radiating hyphae 3–4 μ thick, central cells 3·5–4 μ long, peripheral cells longer, margin fimbriate. Asci aparaphysate, spherical or ovate, 35–45 μ diam., 8-spored, not stained blue by iodine. Spores conglobate, 2-celled, constricted, 20–24 × 10–12 μ, dark brown when mature and strongly echinulate, rounded at both ends, cells sub-equal. Pycnidia similar to thyriothecia but smaller, 100–120 μ diam., conidia ovate, brown, 20–25 × 12–15 μ.

On leaves of *Capparis citrifolia*, Winkle Spruit, Natal, 28/5/15, Doidge, 9010.

I think there can be no doubt that this is the fungus collected by von Thümen, although I have not seen the type specimen. It is the only species which agrees with his description, and the host belongs to the same genus *Capparis*. *A. celtidicola* var. *microspora* on *Maerua* differs in the size of the spores and asci, and in the form of the hyphopodia.

Theissen, judging only by the imperfect description (Syll. F. i, p. 40), and not having seen the type, places this species amongst those imperfectly known, and remarks on its similarity to *A. Capparidis*. From this species (or variety, *A. celtidicola* var. *Capparidis*), *A. sphaerasca* differs in the form of the hyphopodia, which are taller and not lobed.

27. **Asterina loranthicola** Syd.

Ann. Myc. xii, 3, p. 266.

Plate XVI, fig. 32. Slides XXV, 9, 16; XXVI, 19, 20.

Amphigenous; mycelium spreading, composed of hyphae which are straight or nearly straight, brown, 4–6 μ thick, and irregularly branched; hyphopodia not at all numerous, alternate, sessile, 1-celled, cylindrical to obovate, often uncinate, 9–11 μ long, 5–6 μ broad. Thyriothecia densely aggregated, always flattened-hemispherical, 109–160 μ diam., composed of straight, radiating hyphae 3·5–5 μ thick, cells rectangular, up to 7 μ long; margin fimbriate; thyriothecial membrane easily separating into its component parts. Asci aparaphysate, ovate to globose, 30–38 × 24–30 μ, 8-spored. Spores ellipsoid-oblong, 1-septate, brown, rounded at both ends, 20–24 × 8–11 μ, epispore ciliate, upper loculus often slightly broader.

Pycnidia similar to the thyriothecia but smaller; conidia elliptic-pyriform, brown, with or without a hyaline band, 15–22 × 9–11 μ.

On leaves of *Loranthus* sp., Quelimane, Portuguese East Africa, 14/9/17, Pole Evans, 7385.

On leaves of *Loranthus Dregei*, 8/3/15, Pegler (Pegler, 2302), 8863.

28. **Asterina clausenicola** Doidge, sp. nov.

Plate XVI, fig. 33. Slides VI, 16, 17; XLV, 7.

Amphigenous, mostly epiphyllous, effuse, forming a thin, spreading, carbonaceous layer frequently almost covering the upper surface of the leaf. Mycelium delicate, consisting of pale-fuscous hyphae 3–3·5 μ thick, undulating, frequently branching and anastomosing, hyphopodia alternate or unilateral, occasionally opposite, sessile, 1-celled, 6–7 μ high and 9–10 μ broad, deeply 3–5-lobed, each lobe flattened or bilobulate, narrowing suddenly into a base 3–3·5 μ thick. Thyriothecia scattered, flattened-hemispherical, 110–140 μ diam., formed of radiating hyphae 2·5–3 μ thick, with cells 3–3·5 μ long; dehiscing by a stellate fissure; margin fimbriate. Asci aparaphysate, 8-spored, broadly ovate or spherical, sessile, broadly rounded and thickened at the apex, 27–30 × 23–24 μ. Spores conglobate, fuscous, smooth, 1-septate, slightly constricted, 19–20 × 6·5–8 μ, upper loculus usually slightly larger. Pycnidia very numerous, similar to the thyriothecia but smaller, 50–60 μ diam., conidia brown with a hyaline band, continuous, ovate to ellipsoid, 15–18 × 8·5–11·5 μ.

On leaves of *Clausena inaequalis*, Hilton Road, Natal, 21/7/18, Doidge, 11606.

Asterostomella stage only: on *Clausena inaequalis*, Woodbush, Zoutpansberg, 4/8/11, 1754; Buccleuch, Natal, 24/4/16, J. M. Sim, 10149.

29. **Asterina diplocarpa** Cke.

Grevillea, x (1882), p. 129; Syll. Fung. ix, p .381; Die Gattung Asterina, p. 106.

On leaves of *Sida cordifolia*, Inanda, Natal, Herb. Kew, Wood, 601; on *Sida carpinifolia*, São Leopoldo, Rio Grande do Sul, Herb. Theissen; Decades F. Brasil, 54 sub *A. peraffinis*; Rick. F. austro-amer. 325; Ule 673 on *Croton*, Rio de Janeiro, Herb. Berlin and Pazschke sub *A. peraffinis*.

Asterina similis Cke., Grevillea x, p. 130; Syll. Fung. l. cit., on *Sida rhombifolia*, Inanda, Natal, Herb. Kew, Wood, 544, "socia *A. diplocarpa*."

Asterina Sidae Earle, Plants of Porto Rico, 6333, on *Sida* sp., Porto Rico.

Asterina Kwangensis P. Henn. in Herb. Berlin on an *Asclepiadaceae*, Kwango, Congo.

Asterina huallagensis P. Henn., Hedwigia 1904, p. 372; Syll. Fung. xvii, p. 879; on *Croton* sp., Peru (non *Asterina huallagensis* [P. Henn.] Theiss. *Lembosia huallagensis* P.H.).

Plate XVI, fig. 34. Slides XXIV, 11, 14; XXXI, 19; XXXIX, 6.

Mostly epiphyllous, effuse; mycelium undulate, reticulate; hyphae brown or pale fuscous, 3·5–5 μ thick, forming more or less regular zigzag lines; hyphopodia alternate or unilateral, continuous, sessile, 6–7 μ high and 5–10 μ broad, lobed, the majority with three flattened or rounded lobes, erect or hooked. Thyriothecia numerous, crowded, flattened-hemispherical, 100–150 μ diam., composed of radiating hyphae 3–3·5 μ thick, with cells 3–5 μ long; dehiscing by a stellate fissure; margin not fimbriate. Asci 8-spored, aparaphysate, with a short foot, globose or ovate-pyriform, 27–35 μ diam., or 46 × 22 μ, not stained blue by iodine. Spores conglobate, 2-celled, very slightly constricted, dark brown, 17–22 × 8–10 μ; epispore verrucose, upper cell slightly broader. Pycnidia smaller than the thyriothecia, 70–85 μ diam.; conidia continuous, brown, elliptic or pyriform, 18–23 × 12–14 μ.

On leaves of *Sida rhombifolia*, Inanda, 1877, Wood (Wood, 544), 10192.

On leaves of *Sida cordifolia*, Inanda, Wood (Wood, 601), 10194, 9506; Van Staden's Drift, 13/11/17, Doidge, 10858.

On *Hibiscus pedunculatus*, Maritzberg, 21/3/18, Doidge, 9710; East London, 11/11/17, Doidge, 10927.

30. **Asterina tertia** Rac.

On the leaves of different *Acanthaceae* (*Adhatoda*, *Crossandra*, etc.), Buitenzorg, Java, Herb. Raciborsky; Die Gattung Asterina, p. 103.

var. **africana** Doidge, var. nov.

Plate XVI, fig. 35. Slides XXVI, 9, 10; XXIV, 12, 15; XXXI, 18; XXXIII, 15.

Epiphyllous; mycelium radiating, consisting of fuscous, undulating hyphae, 3–3·5 μ thick, irregularly branched and anastomosing; hyphopodia 1-celled, alternate or unilateral, 6–7 μ high and 7–10 μ broad, irregularly lobed, the majority either more or less symmetrical, with 2–3 flattened, rounded or bilobulate lobes, or hooked, with 2–4 rounded lobes on the convex side. Thyriothecia crowded, flattened-hemispherical, 120–130 μ diam., formed of radiating hyphae about 3 μ thick, cells about 3·5 μ long; margin not pronouncedly fimbriate; dehiscence stellate. Asci aparaphysate, 8-spored, broadly ovate to spherical, sessile, thickened round the apex, 30–40 × 23–27 μ. Spores conglobate. 1-septate, fuscous, constricted, 15–18 × 6·5–8 μ; upper cell often slightly broader, epispore minutely verrucose at maturity. Pycnidia smaller than the thyriothecia, 50–70 μ diam.; conidia brown, continuous, ovate to pyriform, 13–17 × 11–13 μ.

On leaves of *Hypoestes aristata* (sub *A. fimbriata*), Inanda, Wood (Wood, 608), 9512.

On *Hypoestes verticillaris*, Kentani, 6/5/15, Pegler (Pegler, 2317), 9074; van Staden's Drift, 12/11/17, Doidge, 10856.

On *Isoglossa Woodii*, Lemana, Zoutpansberg, 14/8/11, Doidge, 1791; East London, 24/11/17, Doidge, 10923.

On *Dicliptera heterostegia*, Mayville, Durban, 22/7/15, Wood, 9028.

On *Peristrophe* sp., Claridge, Natal, 31/5/15, Doidge, 8998.

Theissen ('Die Gattung Asterina,' p. 103) remarks: "Die Art ist kaum mehr als eine Form von *A. diplocarpa*." The species is certainly very closely related to *A. diplocarpa*, but there is a constant if rather slight difference in the form of the hyphopodia. The variety differs from the type in the narrower spores.

Species Excludendae.

Asterina capensis Kalch. et Cke., Grevillea, ix, p. 32; Syll. Fung. ii, p. 41 = *Meliola capensis* (K. et Cke.) Th., Ann. Myc. x, 1912, p. 19; Trans. Roy. Soc. of S. Af. v, 1917, p. 731.

Asterina confluens K. et Cke., Grevillea, ix, p. 33; Syll. Fung. i, p. 49, is the conidial stage of some undetermined fungus; Theissen, Die Gattung Asterina, p. 4.

Asterina ditricha K. et Cke., Grevillea, ix, p. 32 = *Meliola ditricha* (K. et Cke.) Doidge, Trans. Roy. Soc. of S. Af. v, 1917, p. 728.

Asterina interrupta Wint., Flora, 1884, p. 6; Syll. Fung. ix, p. 381 = *Entopeltis interrupta* (Wint.) v. Höhnel, Fragmente z. Myk. 489.

Asterina Macowaniana K. et Cke., Grevillea, ix, p. 33; Syll. Fung. i, p. 41 = *Parenglerula Macowaniana* (K. et Cke.) v. Höhn., l. cit., 525.

Asterina myriadea Cke., Grevillea, x, p. 130; Syll. Fung. ix, p. 389 = *Dimerium myriadeum* (Cke.) Theissen, Ann. Myc. x, p. 193.

Asterina phaeostroma (Cke.), Grevillea, x, p. 130; Syll. Fung. ix, p. 396 = *Balladyna velutina* (Cke.) v. Höhn., Ann. Myc. x, p. 16; Trans. Roy. Soc. of S. Af. v, 1917, p. 716.

Asterina similis Cke., Grevillea, x, p. 130 = *Asterina diplocarpa* Cke., Ann. Myc. x, p. 14.

Asterina solaris K. et Cke., Grevillea, ix, p. 33; Syll. Fung. i, p. 42 = *Asterodothis solaris* (K. et Cke.) Theissen, Ann. Myc. x, p. 179.

Asterina stylospora Cke., Grevillea, x, p. 129, does not belong to the *Microthyriaceae*, Ann. Myc. x, p. 13.

Asterina toruligena Cke., Grevillea, x, p. 129, is not an Asterina, Ann. Myc. x, p. 19.

Asterinella, Th.

Fragmenta brasilica, v, no. 123; Ann. Myc. x, 1912.

Mycelium superficial, creeping, branching, without hyphopodia. Thyrio-

thecia dimidiate, scutate, inverse, radiate in structure, dehiscing from the centre. Asci globose-ovate or elliptical-cylindrical. Spores brown, 2-celled.

Key to the Species.

A. Asci aparaphysate.
  a. Spores 13–17 μ long.
    i. Hyphae 3–3·5 μ diam. . . . . 1. *A. Acokantherae.*
    ii. Hyphae 3·5–5 μ diam., torulose . . . . 2. *A. Burchelliae.*
  b. Spores 20–23 μ long . . . . . 3. *A. Woodiana.*
B. Asci paraphysate . . . . . 4. *A. lembosioides.*

1. **Asterinella Acokantherae** Doidge, sp. nov.

Plate XVII, fig. 36. Slides XXIX, 16; XXXI, 13, 14, 17; XLVII, 4, 5.

Hypophyllous, forming thin, black carbonaceous spots up to 5 mm. diam. Mycelium rather scanty; hyphae pale, fuscous, 3–3·5 μ thick, branching irregularly and anastomosing. Thyriothecia very numerous, brown, gregarious, frequently confluent in small groups, flattened-hemispherical 90–115 μ diam., composed of radiating hyphae about 3 μ thick; margin fimbriate. Asci elliptical-cylindrical, sessile, thickened round the apex, aparaphysate, 8-spored, 26–35 × 13–17 μ. Spores distichous or conglobate, fuscous, ellipsoid or sub-clavate, slightly constricted, 13–17 × 3·5–5 μ, Pycnidia similar to the thyriothecia; conidia hyaline, fusiform, 3-septate, 20-24 × 3-3·5 μ.

On leaves of *Acokanthera spectabilis*, Durban, Natal, 15/5/97, Wood (Wood, 6450 and 6451), 9510 and 9521.

On *Acokanthera venenata*, Tongaat, Natal, 12/9/13, v. d. Bijl, 6951.

Conidial stage only: on *Carissa arduina*, Louis Trichardt, Zoutpansberg, 8/4/19, Putterill, 11849.

Medley Wood's specimens are labelled *Dimerosporium Acokantherae*, but the fungus does not correspond with Henning's description (Fung. Africani, p. 4, Engl. Bot. Jahrb., vol. 17).

2. **Asterinella Woodiana** Doidge, sp. nov.

Plate XVII, fig. 38. Slides XXXIV, 9; XL, 4.

Hypophyllous; mycelium thin, effuse, reticulate; hyphae slender, fuscous, 2·5–3 μ thick, tortuous and interwoven, abundantly branched and anastomosing. Thyriothecia fairly numerous, scattered, light brown, 150–160 μ diam., flattened-hemispherical, formed of radiating hyphae 2–3 μ thick, margin crenulate, or irregularly lobed at maturity. Asci ovate to elliptical, 8-spored, aparaphysate, 33–37 × 27–30 μ. Spores conglobate, 2-celled, fuscous, smooth, constricted, 20–23 × 10 μ, cells sub-equal. Pycnidia similar to the thyriothecia but smaller; conidia (*Asterostomella*) ellipsoid, brown, continuous, 14–16 × 8–10 μ.

Associated with *Meliola Cryptocaryae*, on leaves of *Cryptocarya Woodii*, Mayville, Natal, 22/7/15, Wood, 9025.

On *Cryptocarya Woodii*, Berea, Durban, 29/1/17, v. d. Bijl, 11362.

3. **Asterinella Burchelliae** Doidge, sp. nov.

Plate XVII, fig. 37. Slides IV, 20; XXXIV, 9; XL, 4.

Epiphyllous, forming minute, black spots about 1 mm. diam. Mycelium poorly developed; hyphae brown, 3·5–5 μ thick, frequently septate, undulating, somewhat torulose, cells 10–13 μ long. Thyriothecia 100–120 μ diam., brown, flattened hemispherical, formed of radiating hyphae about 3 μ thick, margin somewhat fimbriate. Asci ellipsoid to cylindrical, thickly tunicated round the apex, sessile, aparaphysate, 27–37 × 16–20 μ. Spores 13–17 × 5–6·5 μ, oblong to clavate, rounded at both ends, upper cell shorter.

On leaves of *Burchellia capensis*, Woodville Forest, George, 11/11/17, Doidge, 10940.

Closely related to *Asterina gibbosa*, from which it differs in the poorly developed mycelium and in the absence of regular nodular swellings.

4. **Asterinella lembosioides** Doidge, sp. nov.

Plate XVII, fig. 39. Slides XLIII, 4–6.

Mycelium slender, arachnoid; hyphae fuscous, 1·5–3 μ thick, tortuous, frequently branched and anastomosing. Thyriothecia scattered, hemispherical, 200–240 μ diam., or broadly ellipsoid, 280–320 × 160–240 μ; formed of radiating hyphae about 2 μ thick, dehiscing by an irregular central fissure. Asci very numerous, paraphysate, ellipsoid to cylindrical, 33–43 × 17–20 μ, somewhat thickened round the apex, which is traversed by a terminal pore; paraphyses numerous, hyaline, exceeding the asci, filiform, swollen, club-shaped at the tips. Spores conglobate or sub-distichous, 15–17 × 8·5–10 μ, 2-celled, fuscous, scarcely constricted cells sub-equal. Pycnidia similar to the thyriothecia; conidia hyaline, continuous, lunate, 17–18 × 1·5–2 μ.

Parasitic on the mycelium of *Balladyna velutina* and *Meliola amphitricha*, on leaves of *Plectronia Guienzii*, Buccleuch, Natal, 17/7/11, Doidge, 11574.

Lembosia Lev.

Syll. Fung. ii, p. 741; Theissen, Lembosia-studien, Ann. Myc. xi (1913).

Mycelium superficial, hyphae branched, septate, with hyphopodia. Thyriothecia dimidiate, inverse, formed of radiating hyphae, typically oblong-linear, dehiscing by an irregular longitudinal fissure. Asci aparaphysate, 8-spored. Spores 2-celled, brown.

Key to the Species.

a. Spores 15–16 μ long . . . . . 1. *L. natalensis.*
b. Spores 17–20 μ long.
i. Thyriothecia up to 800 μ long . . . 2. *L. congesta.*
ii. Thyriothecia not more than 300 μ long . . 3. *L. radiata.*

1. **Lembosia natalensis** Doidge, sp. nov.

Plate XIX, fig. 44. Slide XXV, 13.

Hypophyllous, effuse; hyphae fuscous, 3–3·5 μ thick, branching and anastomosing; hyphopodia very rare, cylindrical or slightly curved, 6 × 3 μ. Thyriothecia scattered, elliptic, sometimes forked, 300–500 × 140–160 μ, dehiscing by a narrow longitudinal slit. Asci paraphysate, 8-spored, ellipsoid to obovate, 30–34 × 20–24 μ. Spores conglobate, 2-celled, fuscous, ellipsoid, scarcely constricted, 15–16 × 6–7 μ. Pycnidia flattened-hemispherical, Asterina-like, 200–250 μ diam., composed of radiating hyphae about 2 μ thick, dehiscence stellate; conidia hyaline, fusoid, 18–20 × 3·5 μ.

On leaves of an undetermined shrub (*Myrtaceae?*), Krantzkloof, Natal, 1/6/15, Doidge, 8984.

2. **Lembosia congesta** Wint.

Exot. Pilze in Flora, 1884, p. 9; Syll. Fung. ix, p. 1105; Hab. ad ramulos juniores *Carissae arduinae* in Promontorio Bonae Spei, Afr. austr. (MacOwan).

Plate XIX, fig. 45. Slides XXVIII, 11–13, 16.

On the younger branches, or less frequently on the leaves; thyriothecia closely packed, forming black, opaque, round irregular spots up to 4 mm. diam. Thyriothecia black, opaque, elongated linear, straight, curved or flexuous, 500–800 × 180–220 μ; oval, attenuated to both ends, 280–340 × 160–175 μ, or rarely almost hemispherical, 160–190 μ diam; dehiscing by a longitudinal slit. Asci oblong to clavate, attenuated into a short foot, 8-spored, paraphysate 60–70 × 21–26 μ; paraphyses filiform, often forked at the apex, tips more or less conglutinate. Spores conglobate or subdistichous, oblong, 1-septate, constricted, fuscous when mature, 17–18 × 7–9 μ. Mycelium on the leaves well developed, fuscous, undulating, abundantly branched, and anastomosing, with a few sessile, dark brown, hemispherical hyphopodia 6·5–8 × 6·5 μ, on the primary hyphae. Mycelium on the branches not so well developed; hyphae straighter, more slender, 3·5–5 μ thick, branches parallel, with occasional elongated reticulations.

On *Carissa arduina*, Lemana, Zoutpansberg, 14/8/11, Doidge, 1786; Isipingo, Natal, 21/5/17, Doidge, 10155; Grahamstown, 15/8/17, Gane, 11369; Cango Valley, Oudtshoorn, 9/11/17, Doidge, 10898; Woodville Forest, George, 11/11/17, Doidge, 10929; Howieson's Poort, Grahamstown,

17/11/17, Doidge, 10960; Lovedale, Alice, 18/11/17, Doidge, 10979; Hogg's Back, 15/1/18, J. & M. Henderson, 11345.

On *Carissa acuminata*, Stella Bush, Durban, 7/4/18, Bottomley, 11381.

On *Carissa grandiflora*, Krantzkloof, Natal, 26/5/15, Doidge, 8983; Isipingo, Natal, 27/3/18, Bottomley, 11380.

3. **Lembosia radiata** Doidge, sp. nov.

Plate XIX, fig. 46. Slide XLVI, 8.

Epiphyllous, rarely hypophyllous, forming dense, opaque, black spots 1·5–2·5 mm. diam. Mycelium delicate, radiating; hyphae slender, fuscous, 3–4 μ thick; branches irregular, interwoven and anastomosing; hyphopodia sub-globose, 6–7 μ diam. Primary thyriothecia densely crowded and confluent in the centre of the spot, so that the boundaries of the individual thyriothecia are often indistinguishable; confluent in a stellate manner; secondary thyriothecia often forming a concentric ring, oriented with the long axis on a radius from the centre; 240–300 × 60–160 μ, formed of radiating hyphae about 3 μ thick; dehiscing by a longitudinal slit almost the length of the thyriothecium. Asci ellipsoid-clavate, 42–45 × 18–23 μ, 8-spored, somewhat thickened round the apex; paraphyses numerous, hyaline, slender, filiform, slightly exceeding the asci, simple or branched, not swollen at the tips; asci do not stain blue with iodine. Spores subdistichous, 1-septate, scarcely constricted, fuscous, smooth, 17–20 × 8–10 μ; cells sub-equal, but upper loculus very slightly broader and rather more broadly rounded.

On leaves of an undetermined shrub (Leguminosae), Rikatli, Portuguese East Africa, 15/9/18, Junod, 11729.

Echidnodes Theiss. et Syd.

Ann. Myc. xvii (1915), p. 422.

Like *Lembosia*, but mycelium non-hyphopodiate.

Echidnodes rhoina Doidge, sp. nov.

Plate XVIII, fig. 43. Slides XXVIII, 7–10.

Amphigenous, mostly epiphyllous, forming minute black spots 1–1·5 mm. diam., often very numerous and confluent. Hyphae septate, brown, 2·5–3·5 μ thick, alternately branched, anastomosing; no hyphopodia. Thyriothecia irregularly scattered, occcasionally confluent, not very numerous, black, oblong-ellipsoid, straight or curved, or occasionally forked, 300–500 × 90–150 μ, dehiscing by a longitudinal slit almost the length of the thyriothecium. Asci 8-spored, paraphysate, broadly elliptic-ovate, somewhat thickened at the apex, 35–40 × 20–24 μ; paraphyses fairly numerous, filiform, exceeding the asci. Spores distichous or con-

globate, 1-septate, constricted, brown, 13–16 μ long ; upper loculus longer and broader, almost globular, 6·5–8 μ broad ; lower loculus 5–6·5 μ broad ; epispore minutely verrucose at maturity.

On leaves of *Rhus lucida*, Van Staden's Pass, 13/11/17, Doidge, 10887 ; Howieson's Poort, Grahamstown, 10957.

Morenoella Speg.

F. Guaran. i, p. 258 ; Theissen, Lembosia-studien, Ann. Myc. xi, p. 425.

Mycelium superficial, hyphae branched, septate, with hyphopodia. Thyriothecia dimidiate, inverse, formed of radiating hyphae, typically oblong-linear, dehiscing by an irregular longitudinal fissure, asci aparaphysate, 8-spored. Spores 2-celled, brown.

Morenoella Oxyanthæ Doidge, sp. nov.

Slides IV, 17 ; XXV, 18 ; XXVI, 17.

Hypophyllous ; thyriothecia very densely crowded, forming black or rusty brown opaque spots, which are round-irregular, and up to 5 mm. diam. Thyriothecia elongated, attenuated towards each end, often curved, 400–600 × 250–300 μ, dehiscing by an irregular, longitudinal slit. Hyphae not distinct in the centre of the spot, but radiating from the thyriothecial mass ; these are more or less densely interwoven, pale, fuscous, slender, branched and anastomosing hyphae, 3–3·5 μ thick, with small, globular, alternate hyphopodia. Asci aparaphysate, 8-spored, elliptic-ovate, sessile, or very briefly pedicellate, very much thickened round the apex, 23–30 × 13–16 μ. Spores distichous or conglobate, ellipsoid or sub-clavate, unevenly 1-septate, the upper cell being shorter and broader, slightly constricted, fuscous when mature, 12–16 × 3·5–5 μ.

On leaves of *Oxyanthus Gerrardi*, Kentani, Pegler (Pegler, 2321), 9073 ; Town Bush Valley, Maritzberg, 21/3/16, Doidge, 9719.

On *Grumilea capensis*, Woodbush, Zoutpansberg, 7/8/11, Doidge, 1758.

Echidnodella Theiss. et Syd.

Ann. Myc. xvii (1915), p. 422.

Like *Morenoella*, but mycelium non-hyphopodiate.

Echidnodella Hypolepidis Doidge, sp. nov.

Slides XXVIII, 14, 15.

Epiphyllous, effuse, usually along the midrib of the pinnule, spots small and often confluent. Hyphae septate, pale-fuscous, slender, 2–3 μ thick, tortuous, abundantly branched and anastomosing ; no hyphopodia. Thyriothecia gregarious, often confluent, straight or curved, and not infrequently forked, oblong-ellipsoid, 120–240 × 50–100 μ, dehiscing by a medial, longitudinal slit almost the length of the thyriothecium ; composed

of hyphae 3–3·5 μ thick, with cells 3·5–5 μ long. Asci (immature) 8-spored, aparaphysate, elliptic-ovate, sessile, rounded at the apex, 20–25 × 7–10 μ. Mature spores only seen outside the ascus, 1-septate, fuscous, 10–14 × 3·5–5 μ, upper cell broader and more broadly rounded.

On pinnules of *Hypolepis sparsisora*, Woodville Forest, George, 11/11/17, Doidge, 10930.

Amazonia Theiss.

Ann. Myc. ii (1913), 499.

Thyriothecia superficial, dimidiate, scutate, formed of radiating hyphae. Asci aparaphysate. Spores 4-septate, brown. Mycelium hyphopodiate.

Amazonia asterinoides (Wint.) Th.

Ann. Myc. ii (1913), 499; and 15 (1917), 421.

Meliola asterinoides Wint., Gaill. Le Genre Meliola, p. 58.

Meliolaster Mackenzii Doidge, Trans. Roy. Soc. of S. Af. viii (1918), p. 122.

Plate XVIII, fig. 42. Slides XLIII, 8–10.

Mostly hypophyllous, less frequently epiphyllous or on the stems, forming minute round spots 1·5–2·5 mm. diam. Mycelium brown, radiating, hyphae flexuous or almost straight, 6–7 μ thick; branches alternate, cells 15–6 μ long; capitate hyphopodia alternate or unilateral, briefly stipitate, curved, 10–15 × 6–7 μ, terminal cell sub-globose, convex; mucronate hyphopodia ampulliform, scattered amongst the capitate hyphopodia, neck sometimes sub-uncinate, 12–15 × 6–7 μ. Thyriothecia gregarious in small groups, flattened-hemispherical or angular by compression, 250–350 μ diam., radiating hyphae straight, 4–6 μ thick, cells about 10 μ long, margin densely fimbriate. Asci aparaphysate, evanescent, ellipsoid, 2-spored, 50–57 × 20–23 μ. Spores cylindrical-compressed or sub-clavate, 4-septate, rounded at both ends, slightly constricted, 33–37 × 10–13·5 μ.

On *Piper capensis*, Buccleuch, Natal, 17/8/18, Doidge, 11570.

Host Index

(According to Genera and Families).

Abbreviations:—*A.* = *Asterina*; *Ala.* = *Asterinella*; *E.* = *Englerulaster*; *L.* = *Lembosia*; *M.* = *Morenoella*; *Mna.* = *Morenoina*; *Am.* = *Amazonia*; *Mic.* = *Microthyrium*; *S.* = *Seynesia*; *P.* = *Parasterina*; *Ech.* = *Echidnodes*; *Echla.* = *Echidnodella*.

Acanthaceae . . *A. fimbriata.*
cfr. Dicliptera. *A. tertia* var. *africana.*
Hypoestes.
Isoglossa.
Peristrophe.
Sclerochiton.
Acalypha . . *A. tenuis.*
Acokanthera . . *Ala. Acokantherae.*
Alberta . . . *A. gibbosa* var. *megathyria*
Anacardiaceae . *A. Peglerae.*
cfr. Rhus. *Ech. Rhoina.*
Anonaceae . . *E. Popowiae.*
cfr. Popowia.

Ansellia . . . *A. raripoda.*
Apocynaceae . . *P. rigida.*
cfr. Acokanthera. *Ala. Acokantherae.*
Carissa. *L. congesta.*
Oncinotis.
Aquifoliaceae . . *E. orbicularis.*
cfr. Ilex. *A. Hendersoni.*
Araliaceae . . *A. ferruginosa.*
cfr. Cussonia.
Asclepiadaceae . *A. peraffinis.*
cfr. Tylophora.
Burchellia . . *Ala. Burchelliæ.*
Capparidaceae . *A. celtidicola* var. *microspora.*
cfr. Capparis. *A. sphaerasca.*
Maerua.
Capparis . . *A. sphaerasca.*
Carissa . . . *Ala. Acokantherae.*
L. congesta.
Celastraceae . . *E. Gymnosporiae.*
cfr. Gymnosporia.
Putterlickia.
Chrysophyllum . *A. opaca.*
Claoxylon . . *A. tenuis.*
Clausena . . . *A. clausenicola.*
Combretaceae . . *A. Combreti.*
cfr. Combretum.
Combretum . . *A. Combreti.*
Compositae . . *A. natalensis.*
cfr. Mikania.
Cryptocarya . . *Ala. Woodiana.*
Cussonia . . . *A. ferruginosa.*
Dalechampia . . *A. tenuis.*
Dicliptera . . *A. tertia,* var. *africana.*
Dryopteris . . *Mna. africana.*
Ebenaceae . . *S. orbiculata.*
cfr. Euclea.
Euclea . . . *S. orbiculata.*
Eugenia . . . *A. brachystoma.*
Euphorbiaceae . *A. Excoecariae.*
cfr. Acalypha. *A. tenuis.*
Claoxylon.
Dalechampia.
Excoecaria.
Excoecaria . . *A. Excoecariae.*
Flacourtiaceae . *A. delicata.*
cfr. Oncoba. *A. celtidicola* var.
Trimeria. *microspora.*
Grewia . . . *A. Grewiae.*
Grumilea . . *P. brachystoma* var. *laxa.*
M. Oxyanthae.
Gymnosporia . . *E. Gymnosporiae.*
Hibiscus . . . *A. diplocarpa.*
Hypoestes . . *A. fimbriata.*
A. tertia var. *africana.*
Hypolepis . . *Echla. Hypolepidis.*
Ilex . . . . *A. Hendersoni.*
E. orbicularis.
Isoglossa . . . *A. tertia* var. *africana.*
Jasminum . . *A. erysiphoides.*
Kraussia . . . *A. gibbosa* var. *megathyria.*
Lauraceae . . *Ala. Woodiana.*
cfr. Cryptocarpa.
Leguminosae . . *L. radiata.*
Loranthaceae . . *A. loranthicola.*
cfr. Loranthus.
Loranthus . . *A. loranthicola.*
Maerua . . . *A. celtidicola* var. *microspora.*
Malvaceae . . *A. diplocarpa.*
cfr. Hibiscus.
Sida.
Meliaceae . . *A. Trichiliae.*
cfr. Trichilia.
Mikania . . . *A. natalensis.*
Myrtaceae . . *P. brachystoma.*
cfr. Eugenia. *L. natalensis.*
Oleaceae . . . *A. erysiphoides.*
cfr. Jasminum.
Olinia . . . *A. reticulata.*
Oliniaceae . . *A. reticulata.*
cfr. Olinia.
Oncinotis . . *P. rigida.*
Oncoba . . . *A. celtidicola* var. *microspora.*
Orchidaceae . . *A. raripoda.*
cfr. Ansellia.
Osyridicarpus . . *A. polythyria.*
Oxyanthus . . *P. brachystoma* var. *laxa.*
M. Oxyanthae.
Pavetta . . . *A. gibbosa* var. *megathyria.*
Peristrophe . . *A. tertia* var. *africana.*

Piper . . . *Am. asterinoides.*
Piperaceae . . *Am. asterinoides.*
cfr. Piper.
Pittosporaceae . *A. robusta.*
cfr. Pittosporum.
Pittosporum . . *A. robusta.*
Plectronia . . *A. gibbosa* var. *megathyria.*
A. fimbriata.
Ala. lembosioides.
Polypodiaceae . *Echla. Hypolepidis.*
cfr. Dryopteris. *Mna. africana.*
Hypolepis.
Popowia . . . *E. Popowiae.*
Putterlickia . . *E. Gymnosporiae.*
Randia . . . *A. gibbosa* var. *megathyria.*
Rhamnaceae . . *A. rhamnicola.*
cfr. Rhamnus. *A. uncinata.*
Rhamnus . . *A. rhamnicola.*
A. uncinata.
Rhus . . . *A. Peglerae.*
Ech. Rhoina.
Rinorea . . . *A. ? vagans.*
Rosaceae . . . *A. Balansae* var. *africana.*
cfr. Rubus.
Rubiaceae . . *A. brachystoma* var. *laxa.*
cfr. Alberta. *A. fimbriata.*
Burchellia. *A. gibbosa* var.
Grumilea. *megathyria.*
Kraussia. *Ala. Burchelliae.*
Oxyanthus. *Ala. lembosioides.*
Pavetta. *M. Oxyanthae.*
Plectronia.
Randia.
Tricalysia.
Rubus . . . *A. Balansae* var. *africana.*
Rutaceae . . *A. clausenicola.*
cfr. Clausena.
Santalaceae . . *A. polythyria.*
cfr. Osyridicarpus.
Sapotaceae . . *P. implicata.*
cfr. Chryso- *A. opaca.*
phyllum.
Sideroxylon.
Sclerochiton . . *A. fimbriata.*
Sida . . . *A. diplocarpa.*
Sideroxylon . . *P. implicata.*
Tiliaceae . . . *A. Grewiae.*
cfr. Grewia.
Tricalysia . . *A. gibbosa* var. *megathyria.*
Trichilia . . . *A. Trichiliae.*
Trimeria . . . *A. delicata.*
Tylophora . . *A. peraffinis.*
Viola . . . *A. undulata.*
Violaceae . . *A. vagans.*
cfr. Rinorea. *A. undulatu.*
Viola.

Descriptions of New Species, etc.

Asterina brachystoma (Rehm.) Th.
var. *laxa* Doidge, var. nov.

A typo differt mycelio laxo, tenuiore; hyphopodiis minoribus et pauciori-bus.

Asterina (*Clypeolaster*) *clausenicola* Doidge, sp. nov.

Mycelium amphigenum, plerumque epiphyllum; hyphis irregulariter ramosis, undulatis, gracilibus, 3–3·5 μ crassis, fuligineo-brunneis; hyphopodiis alternis, sessilibus, profunde trilobatis vel quinquelobatis, 6–7 μ altis, 9–10 μ latis, a base 3–3·5 μ cr. abrupte attenuatis. Thyriothecia sparsa, hemisphaerica, 110–140 μ diam., ex hyphis angustis 2·5–3 μ crassis contexta, margine fimbriata, stellatim dehiscentia. Asci aparaphysati, octospori, sub-globosi vel ovati, 27–30 × 23–24 μ. Sporae fuligineo-brunneae, laeves, uniseptatae, leviter constrictae, 19–20 × 6·5–8 μ, loculo supero parum latiore, utrinque rotundatae.

Hab. in foliis *Clausenae inaequalis*, Hilton Road, Natal, 21/7/18, leg. Doidge, 11606.

Asterina celtidicola P. Henn.

var. *microspora* Doidge, var. nov.

A typo differt sporis minoribus, 14–20 × 8–10 μ.

Asterina delicata Doidge, sp. nov.

Mycelium epiphyllum, tenuissimum; hyphis alterne ramosis, 3–3·5 μ crassis, fuscis, cellulis 20–24 μ longis; hyphopodiis alternis, sessilibus, aut angularibus, aut sublobatis, 6–7 μ altis, 6–10 μ latis. Thyriothecia gregaria vel sparsa, applanato-hemisphaerica, 100–130 μ diam., ex hyphis rectis 3 μ crassis contexta, centro irregulariter aperta. Asci aparaphysati, ovati vel sub-globosi, 26–33 × 33–40 μ. Sporae brunneae, 1-septatae, constrictae, 20–22 × 10–12 μ, laeves, utrinque rotundatae, loculis fere aequalibus.

Hab. in foliis *Trimeriae alnifoliae*, prope Durban, Natal, 22/7/15, leg. Medley Wood, 9062.

Asterina erysiphoides Kalch. et Cke. Char. emend.

Mycelium effusum, epiphyllum, tenue; hyphis brunneis, 3·5–5 μ crassis, ramosis, anastomosantibusque; hyphopodiis alternis, sessilibus, continuis, erectis v. uncinatis, irregulariter 3–5 lobatis, 7–13 μ altis, 5–10 μ latis. Thyriothecia applanato-hemisphaerica, sub-opaca, fimbriata, 120–130 μ diam., ex hyphis 3–3·5 μ crassis contexta, stellatim dehiscentia. Asci aparaphysati, sub-globosi, 30–34 μ diam. Sporae brunneae, a maturitate verrucosae, 1-septatae, constrictae, utrinque rotundatae, 20–23 × 10–12 μ, loculo superiore latiore.

Hab. in foliis *Jasmini multipartiti*, Natal, 14/7/15, leg. Medley Wood, 9018.

Asterina Excoecariae Doidge, sp. nov.

Mycelium amphigenum, effusum, hyphis tenuibus, undulatis, 3–3·5 μ crassis, alterne ramosis, cellulis circ. 16 μ longis; hyphopodiis sessilibus, alternis vel unilateralibus, varie lobatis, 6–7 μ altis, 6–8 μ latis. Thyriothecia sparsa, applanato-hemispherica, 100–120 μ diam., ex hyphis angustis, 2·5–3 μ cr. contexta, stellatim dehiscentia. Asci aparaphysati, octospori, sub-globosi, 35–40 μ diam. Sporae brunneae, uniseptatae, constrictae, 23–27 × 12-13·5 μ; episporio a maturitate verrucoso; loculo superiore latiore.

Hab. in foliis *Excoecariae* sp., Winkle Spruit, Natal, leg. Doidge, 9009.

Asterina ferruginosa Doidge, sp. nov.

Mycelium epiphyllum; hyphis brunneis, tenuibus, 4–6 μ crassis, alterne ramosis, cellulis 23–27 μ longis; hyphopodiis continuis, alterne vel unilateralibus, hemisphaericis vel sub-globosis, 6–8 μ altis, 8–10 μ latis, rare stipitatis, 12–13 μ altis. Thyriothecia numerosa, sparsa vel gregaria,

applanato-hemisphaerica, ferruginea, 160–190 μ diam., ex hyphis rectis, 3–3·5 μ cr. contexta, margine copiose fimbriato, stellatim dehiscentia. Asci aparaphysati, octospori sub-globosi, 33–37 μ diam. Sporae brunneae, leniter constrictae, laeves, 23–26 × 11–12·5 μ, loculo superiore parum latiore.

Hab. in foliis *Cussoniae umbelliferae*, Woodbush, 3/8/11, leg. Doidge, 1774.

Asterina gibbosa Gaill.

var. *megathyria* Doidge, var. nov.

A typo differt thyriotheciis gregariis, majoribus, 140–200 μ diam. ex hyphis 2–4 μ cr., rectis, contextis; ascis 33–34 × 27–33 μ.

Asterina Hendersoni Doidge, sp. nov.

Mycelium amphigenum, undulatum; hyphis brunneis, flexuosis, 5–6 μ crassis, sub-torulosis, alterne ramosis, cellulis 6–8 μ longis; hyphopodiis alternis, hemisphaericis v. sub-angulatis, 3·5–6 μ diam. Thyriothecia sparsa, applanato-hemisphaerica, 150–200 μ diam., ex hyphis brunneis, undulatis, 3·5 μ crassis contexta, irregulariter dehiscentia. Asci aparaphysati, octospori, ovati, 45–50 × 26–33 μ. Sporae laeves, brunneae, 23–25 μ longae, constrictae, loculo supero sub-globoso, 13–13·5 μ lato, infero 10–11 μ lato.

Hab. in foliis *Ilicis capensis*, Hogg's Back, 15/1/18, leg. J. et M. Henderson, 11341, 11342.

Parasterina implicata Doidge, sp. nov.

Mycelium epiphyllum, implicatum; hyphis brunneis, torulosis, 6–7 μ crassis, irregulariter ramosis, reticulatis, cellulis 15–25 μ long.; hyphopodiis sessilibus, alternis, paucis, hemisphaericis, ovatis vel oblique compressis, 6–10 μ altis, 10–6 μ latis. Thyriothecia gregaria, applanato-hemispherica, 300–400 μ diam., ex hyphis 3·5–5 μ crassis contexta, irregulariter v. stellatim dehiscentia. Asci ovati v. globosi, octospori, paraphysati, 57–73 × 50–70 μ; paraphysibus numerosis, filiformis. Sporae fuscae, uniseptatae, constrictae, 35–40 × 10–13 μ, loculo supero parum latiore.

Hab. in foliis *Sideroxylon inermis*, East London, 24/11/17, leg. Doidge, 10922.

Asterina natalensis Doidge, sp. nov.

Mycelium epiphyllum, tenue; hyphis brunneis, 3–5 μ crassis, irregulariter ramosis; hyphopodiis plerumque alternis, rare oppositis; breviter pedicellatis, 8–14 μ altis, 6–10 μ latis, supra sublobatis vel curvatis. Thyriothecia applanato-hemisphaerica, 120–130 μ diam., ex hyphis 3–3·5 μ cr. contexta, margine fimbriata, stellatim dehiscentia. Asci aparaphysati, lati cylindracei v. globosi, octospori 26–32 × 20–24 μ. Sporae brunneae, uniseptatae, constrictae, 15–19 × 9–10 μ, loculo supero parum latiore, episporio tenuiter verrucoso.

Hab. in foliis *Mikaniae* sp., Winkle Spruit, Natal, 28/5/15, leg. Doidge, 9001.

Asterina Peglerae Doidge, sp. nov.

Mycelium hypophyllum; hyphis fuscis, tenuibus, 3·5–4 μ crassis, alterne ramosis; hyphopodiis alternis, pedicellatis, 10–15 μ altis, 6–10 μ latis, supra bi- v. trilobatis, rectis vel recurvatis. Thyriothecia sparsa, ex hyphis undulatis, 2·5–3 μ cr. contexta; stellatim dehiscentia; ambitu fimbriata. Asci aparaphysati, sub-globosi, octospori, 45–50 × 43–45 μ. Sporae atro-brunneae, opacae, uniseptatae, constrictae, 23–28 × 13–16·5 μ, loculo supero majore, episporio ciliata.

Hab. in foliis *Rhois*? sp., Kentani, 16/9/15, leg. Pegler (Pegler, 2354), 9130.

Asterina polythyria Doidge, sp. nov.

Mycelium epiphyllum; hyphis brunneis, sinuosis, 3·5–6·5 μ crassis, cellulis 10–20 μ longis, ramis plerumque oppositis; hyphopodiis continuis, 2–3 lobatis, 5–7 μ altis, 6–10 μ latis. Thyriothecia numerosa, densiuscule disposita, aut applanato-hemisphaerica, 150–170 μ diam., stellatim dehiscentia, aut oblonga, 190–200 × 140 μ, rima longitudine dehiscentia. Asci cylindracei v. ovati, aparaphysati, octospori, 26–40 × 20–24 μ. Sporae brunneae, sub-constrictae, laeves, 16–20 × 6–7 μ, loculo supero paulo majore.

Hab. in foliis *Osyridicarpi natalensis*, Tongaat, Natal, 12/9/13, leg. v. d. Bijl, 6949.

Asterina raripoda Doidge, sp. nov.

Mycelium epiphyllum, parce evolutum, alterne ramosum; hyphis fuscis 3·5–5 μ crassis, undulatis, cellulis 10–15 μ longis; hyphopodis raris, alternis, continuis, hemisphaericis, 4–5 μ altis, 6–7 μ latis. Thyriothecia sparsa, applanato-hemisphaerica, alia in summis hyphis secundariis, alia in mediis hyphis primariis oriunda, 150–200 μ diam., centro umbilicato et irregulariter stellatim dehiscentia, margine crenulata. Asci aparaphysati, cylindracei v. ovati, octospori, 40–52 × 16–24 μ. Sporae brunneae, vix constrictae, laeves, 15–18 × 7–10 μ, loculo supero latiore, globose; infere ellipsoideo.

Hab. in foliis *Anselliae africanae*, Zululand, April 1913, leg. M. Franks, 6687.

Asterina reticulata K. et Cke., char. emend.

Mycelium amphigenum, effusum, reticulatum; hyphis brunneis, rectis, 5–6 μ crassis, cellulis 15–30 μ longis; ramis plerumque oppositis, anastomosantibus; hyphopodiis alternis, breviter pedicellatis, clavatis, recurvatis v. sub-lobatis, 7–13 × 6–8 μ. Thyriothecia applanato-hemisphaerica, 160–240 μ diam., ex hyphis rectis, 3–3·5 μ cr. contexta, margine fimbriato, poro irregulari centrali et demum stellatim dehiscentia. Asci aparaphysati, sessiles, ovati, 45–50 × 30–33 μ. Sporae brunneae, uniseptatae, constrictae, laeves, 20–23 × 10 μ, loculis sub-aequalibus, vel supero parum latiore.

Hab. in foliis *Oliniae* sp., Barberton, 18/1/91, leg. Galpin (Galpin, 1275).

Asterina rhamnicola Doidge, sp. nov.

Mycelium epiphyllum, tenue; hyphis rectis, brunneis, 6–7 μ crassis, alterne ramosis, cellulis 25–30 μ long.; hyphopodiis alternis, continuis, cylindraceis v. hemisphaericis, 6–10 μ altis, 6–7 μ latis. Thyriothecia pauca, sparsa, conico-hemisphaerica, quam mycelium pallidiores, 225–280 μ diam., ex hyphis rectis, 3–5 μ cr. contexta, margine haud fimbriata, medio irregulariter dehiscentia. Asci aparaphysati, late ellipsoidei vel ovati, octospori, 45–50 × 23–33 μ. Sporae fuscae, obsolete constrictae, laeves, 23–25 × 9–10 μ, loculo supero majore.

Hab. in foliis *Rhamni prinoides*, Woodbush, Transvaal, 4/8/11, leg. Doidge, 1752.

Parasterina rigida Doidge, sp. nov.

Mycelium epiphyllum, hyphis brunneis, 5–6 μ crassis, alterne ramosis, anastomosantibus, cellulis 16–20 μ long; hyphopodiis numerosis, plerumque oppositis, continuis, hemisphaericis vel ovatis, 6–8 μ altis, 5–6 μ latis. Thyriothecia congregata, applanato-hemisphaerica, 250–400 μ diam., ex hyphis rectis, 5 μ crassis contexta, medio irregulariter dehiscentia. Asci paraphysati, late ellipsoidei vel ovati, 60–75 × 30–40 μ, tunicati, apice poro pertusi; paraphysibus filiformis, apicibus incrassatis. Sporae fuscae, uniseptatae, constrictae, laeves, 27–33 × 13–15 μ, loculo supero majore.

Hab. in foliis *Oncinotis inandensis*, Buccleuch, Natal, 11/5/16, leg. Doidge, 9722.

Asterina robusta Doidge, sp. nov.

Mycelium epiphyllum, atro-brunneum; hyphis torulosis, 6–7 μ cr., cellulis circ. 20 μ long., alterne vel opposite ramosis; hyphopodiis unilateralibus vel alternis, continuis, sub-hemisphaericis, 6–6·5 × 6·5–7 μ. Thyriothecia applanato-hemisphaerica, opaca, atro-brunnea, ex hyphis rectis circ. 5 μ cr. contexta, medio irregulariter dehiscentia. Asci aparaphysati, octospori, 65–75 × 45–55 μ, muco viridulo involuti. Sporae atro-brunneae, uniseptatae, constrictae, 35–40 × 18–20 μ, loculis globosis, supero parum latiore.

Hab. in foliis *Pittospori viridiflori*, Mossel Bay, 22/7/15, leg. Pole Evans, 9066.

Asterina tertia Rac.

var. *africana* Doidge, var. nov.

A typo differt sporis angustioribus; sporis 15–18 × 6·5–8 μ. Hab. in foliis *Isoglossae Woodii*, Zoutpansberg, 14/8/11, leg. Doidge, 1791.

Asterina Trichiliae Doidge, sp. nov.

Mycelium epiphyllum; hyphis brunneis, rectis, 4-6 μ crassis, opposite ramosis; hyphopodiis oppositis, rare alternis, cylindraceis v. pyriformis, continuis, 6–10 μ altis, 4–5 μ latis. Thyriothecia sparsa, applanato-hemisphaerica, opaca, ex hyphis rectis, 3–3·5 μ crassis contexta, margine fimbriata,

stellatim dehiscentia. Asci aparaphysati, octospori, ovati vel sub-globosi, 40–46 × 43–50 μ, muco viridulo involuti. Sporae atro-brunneae, uniseptatae, constrictae, 25–27 × 12–13 μ, episporio verrucoso, loculo supero parum latiore.

Hab. in foliis *Trichiliae Dregeanae*, Winkle Spruit, Natal, 28/5/16, leg. Doidge, 9006.

Asterina uncinata Doidge, sp. nov.

Mycelium epiphyllum, effusum, tenue, irregulariter ramosum; hyphis undulatis, 5–6 μ crassis, cellulis 26–33 μ long.; hyphopodiis alternis, uncinatis, rare oppositis, pedicellatis, 20–40 μ altis; cellula basali, 1–2 septata, 7–30 μ longa, cylindrica, recta, curvata vel abrupte geniculata; cellula superiore clavata, v. cylindrica, recta vel uncinata, rare sub-lobata. Thyriothecia applanato-hemisphaerica, 200–280 μ diam., ex hyphis medio rectis, margine undulatis, 3–5 μ crassis contexta; poro centrali et stellatim dehiscentia, margine haud fimbriata. Asci aparaphysati, sub-globosi, 42–50 × 40–45 μ. Sporae atro-brunneae, opacae, 30–40 × 16–20 μ, uniseptatae, valde constrictae; loculis ovatis, supero 18–20 μ lato, infero 14–16 μ lato.

Hab. in foliis *Rhamni prinoides*, Brander's High Forest, Victoria East, 12/8/15, leg. v. d. Bijl, 9463. *A. rhamnicola* consocia.

Asterina undulata Doidge, sp. nov.

Mycelium epiphyllum, laxum, tenue; hyphis pallide fuscis, undulatis, gracilibus, 5–6 μ crassis, laxe ramosis, cellulis 18–20 μ long., hyphopodiis alternis, continuis 5–6·5 μ altis, 7–10 μ latis, varie lobatis. Thyriothecia applanato-hemisphaerica, in summis hyphis secundariis oriunda, congregata, margine haud fimbriata, ex hyphis angustis, rectis, 2·5–3 μ cr. contexta, stellatim dehiscentia. Asci aparaphysati, octospori, ovati, 20–24 × 17–20 μ. Sporae brunneae, anguste ovatae, uniseptatae, constrictae, 13–15 × 6–8·5 μ, loculo supero parum latiore.

Hab. in foliis *Violae abyssinicae*, Woodbush, Zoutpansberg, 4/8/11, leg. Doidge, 1769.

Asterinella Acokantherae Doidge, sp. nov.

Mycelium parvum, epiphyllum; hyphis pallide fuscis, 3–3·5 μ diam., irregulariter ramosis. Thyriothecia congregata, applanato-hemisphaerica, 90–115 μ diam., ex hyphis rectis, 3 μ cr. contexta, margine fimbriata. Asci ellipsoidei v. cylindracei, sessiles, apice tunicati, aparaphysati, octospori, 26–35 × 13–17 μ. Sporae fuscae, distichae vel conglobatae, ellipticae v. sub-clavatae, uniseptatae, obsolete constrictae, 13–17 × 3·5–5 μ.

Hab. in foliis *Acokantherae venenatae*, Tongaat, Natal, 12/9/13, leg. v. d. Bijl, 6951.

Asterinella Burchelliae Doidge, sp. nov.

Mycelium epiphyllum, parce evolutum; hyphis brunneis, sub-torulosis

3·5–5 μ crassis, cellulis 10–13 μ longis, undulatis. Thyriothecia applanato-hemisphaerica, 100–120 μ diam., ex hyphis rectis, 3 μ cr. contexta, margine sub-fimbriata. Asci aparaphysati, elliptici v. cylindracei, apice crasse tunicati, 27–37 × 16–20 μ. Sporae oblongae v. clavatae, 13–17 × 5–6·5 μ, utrinque rotundatae, loculo supero breviore.

Hab. in foliis *Burchelliae capensis*, Woodville Forest, George, 11/11/17, leg. Doidge, 10940.

Asterinella lembosioides Doidge, sp. nov.

Mycelium tenue, arachnoideum; hyphis fuscis, tortuosis, 1·5–3 μ crassis, dense ramosis, anastomosantibus. Thyriothecia sparsa; hemisphaerica, 200–240 μ diam., vel late elliptica, lembosioides, 280–320 × 160–240 μ; ex hyphis rectis circ. 2 μ cr. contexta, medio irregulariter dehiscentia. Asci numerosi, paraphysati, elliptici v. cylandracei, 33–43 × 17–20 μ, apice incrassati et poro pertusi; paraphysibus numerosis, hyalinis, ascos superantibus, apice leniter incrassatis. Sporae conglobatae v. sub-distichae, 15–17 × 8·5–10 μ, uniseptatae, obsolete constrictae, loculis sub-aequalibus.

Parasitica in mycelio *Balladynae velutinae* et *Meliolae amphitrichae* in foliis *Plectroniae Guienzii*, Buccleuch, Natal, 17/7/18, leg. Doidge, 11574.

Asterinllae Woodiana Doidge, sp. nov.

Mycelium hypophyllum, effusum, tenue, reticulatum; hyphis tenuibus, fuscis, 2·5–3 μ crassis, tortuosis et intertextis, valde ramosis, anastomosantibus. Thyriothecia sparsa, brunnea, ex hyphis rectis, 2–3 μ cr. contexta, margin crenulato v. a maturitate irregulariter lobato. Asci ovati v. elliptici, octospori, aparaphysati, 33–37 × 27–30 μ. Sporae conglobatae, fuscae, laeves, uniseptatae, constrictae, 20–23 × 10 μ, loculis sub-aequalibus.

Meliola Cryptocarya consocia, in foliis *Cryptocaryae Woodii*, Mayville, Natal, 22/7/15, leg. Medley Wood, 9025.

Englerulaster Popowiae Doidge, sp. nov.

Mycelium epiphyllum, brunneum, radiatum; hyphis 5–6 μ crassis, crebre septatis, ramis oppositis v. alternis, anastomosantibus; hyphopodiis sessilibus, alternis, nonnunquam oppositis, capitatis v. ellipsoideis, rectis v. recurvatis, 10–13·5 × 6–8 μ, rare 16 μ altis. Thyriothecia atro-brunnea, 160–190 μ diam., ex hyphis 5–6 μ cr. contexta, ex centro demum latius aperta, margine fimbriata. Asci globosi v. ovati, apedicellati, octospori, aparaphysati, 40–47 × 30–40 μ. Sporae brunneae, constrictae, uniseptatae, 21–27 × 10–13·5 μ, loculis sub-globosis, aequalibus, v. supero parum latiore; episporio minute verrucoso.

Hab. in foliis *Popowiae caffrae*, Buccleuch, Natal, 24/3/16, leg. Doidge, 9714.

Lembosia natalensis Doidge, sp. nov.

Mycelium hypophyllum, effusum; hyphis fuscis, 3–3·5 μ crassis, ramosis-anastomosantibus; hyphopodiis paucis, cylindraceis v. subcurvatis, 6 × 3 μ.

Thyriothecia sparsa, elliptica, nonnunquam bifurcata, 300–500 × 140–160 μ, rima anguste longitudinale dehiscentia. Asci paraphysati, octospori, ellipsoidei v. obovati, 30–34 × 20–24 μ. Sporae conglobatae, fuscae, uniseptatae, ellipsoideae, obsolete constrictae, 15–16 × 6–7 μ. Pycnidia applanato-hemisphaerica. Asterinoidea, 200–250 μ diam., ex hyphis circ. 2 μ cr. contexta, stellatim dehiscentia. Conidia hyalina, fusoidea, 18–20 × 3·5 μ.

Hab. in foliis fruticis ignotis (? *Myrtacearum*), Krantzkloof, Natal, 1/6/15, leg. Doidge, 8984.

Lembosia radiata Doidge, sp. nov.

Mycelium epiphyllum rare hypophyllum, plagulas opacas 1·5–2·5 mm. diam., efficiens ; hyphis tenuibus fuscis, 3–5 μ crassis, ramis intertextis, anastomosantibus ; hyphopodiis sub-globosis, 6–7 μ diam. Thyriothecia primaria centro stellatim congregata, secundaria in circulo concentrico radiatim disposita ; ellipsoidea, 240–300 × 60–160 μ, ex hyphis circ. 3 μ cr. contexta, rima longitudinale dehiscentia. Asci paraphysati, octospori, ellipsoidei v. clavati, 42–45 × 18–23 μ ; paraphysibus tenuibus, filiformis, vix ascos superantibus, simplicibus v. bifurcis, apice haud incrassatis. Sporae sub-distichae, uniseptatae, obsolete constrictae, fuscae, laeves, 17–20 × 8–10 μ, loculis subaequalibus vel supero parum latiore.

Hab. in foliis *Leguminosae* indet., Rikatli, Portuguese East Africa, Sept., 1918, leg. Junod, 11729.

Echidnodes rhoina Doidge, sp. nov.

Mycelium amphigenum, plerumque epiphyllum ; hyphis septatis, brunneis, 2·5–3·5 μ crassis, alterne ramosis ; hyphopodiis nullis. Thyriothecia sparsa, haud numerosis, atra, oblonga vel ellipsoidea, recta v. curvata, rare bifurca, 300–500 × 90–150 μ, rima longitudinale dehiscentia. Asci paraphysati, octospori, late ellipsoidei v. ovati, apice obsolete incrassati, 35–40 × 20–24 μ ; paraphysibus filiformis, ascos superantibus. Sporae distichae v. conglobatae, brunneae, uniseptatae constrictae, 13–16 μ longae ; episporio minute verrucoso.

Hab. in foliis *Rhois lucidae*, van Staden's Pass, 13/11/17, leg. Doidge, 10887.

Microthyrium maculicolum Doidge, sp. nov.

Thyriothecia epiphylla in maculas fuscas sparsa, atro-brunnea, applanato-hemisphaerica, 150–190 μ diam., ex hyphis fuscis 3–4 μ crassis contexta, margine haud fimbriata. Asci octospori, aparaphysati elliptici, apice late rotundati, 70 × 27 μ vel ovati, 50–57 × 30–43 μ, apedicellati, tenuiter tunicati. Sporae conglobatae v. sub-parallelae, hyalinae, 1-septatae, haud v. obsolete constrictae, 21–23·5 × 6·5–10 μ, loculo supero latiore.

Hab. in foliis fruticis indet. (*Capparis*?), Durban, 11/4/18, leg. Bottomley, 11668.

Echidnodella Hypolepidis Doidge, sp. nov.

Epiphyllum, effusum ; hyphis fuscis, pallidioribus, tenuibus, 2–3 μ crassis, tortuosis, dense ramosis, anastomosantibus ; hyphopodiis nullis. Thyriothecia congregata, recta v. curvata, nonnunquam bifurca, oblonga v. elliptica, 120–240 × 50–100 μ, rima longitudinale dehiscentia, ex hyphis 3–3·5 μ cr. contexta. Asci (immaturi) octospori, aparaphysati, elliptici vel ovati, apice rotundati, 20–25 × 7–10 μ. Sporae (maturae ex ascos visae) fuscae, haud v. obsolete constrictae, 10–14 × 3·5–4 μ, loculo supero latiore.

Hab. in pinnulis *Hypolepidis sparsisorae*, George, 11/11/17, leg. Doidge, 10930.

Morenoella Oxyanthae Doidge, sp. nov.

Hypophylla ; thyriothecia crustose denseque congregata, elongata, utrinque attenuata, saepe curvata, 400-600 × 250–300 μ, rima longitudinale irregulare dehiscentia. Mycelium radiatum, hyphis tenuibus, intertextis, ramosis, anastomosantibus, 3–3·5 μ cr., hyphopodiis minutis, alternis, globosis. Asci aparaphysati, octospori, elliptici vel ovati, sessiles v. breviter pedicellati, apice valde incrassati. Sporae distichae v. conglobatae, ellipticae v. subclavatae, vix constrictae, uniseptatae, fuscae, 12–16 × 3·5–5 μ, loculo supero breviore et latiore.

Hab. in foliis *Oxyanthi Gerrardi*, Kentani, leg. Pegler (Pegler, 2321), 9073.

Morenoina africana Doidge, sp. nov.

Epiphyllum, mycelium evanescens. Thyriothecia sparsa, anguste elliptica, 120–400 × 65–100 μ, recta v. subcurvata, nonnunquam bifurca v. aliquantum sinuosa, rima longitudinale dehiscentia, ex hyphis 2·5–3 μ crassis contexta, margine breviter fimbriata. Asci (immaturi) aparaphysati, ellipsoidei v. clavati, breviter pedicellati, 23–27 × 10–12 μ, jodo non caerulescentes. Sporae (extra ascos visae), fuscae, obsolete constrictae, laeves, 12–14 × 5–6·5 μ, loculis aequalibus.

Hab. in pinnulis *Dryopteridis inaequalis*, Zwartkop, Natal, 19/7/18, leg. Doidge, 11605.

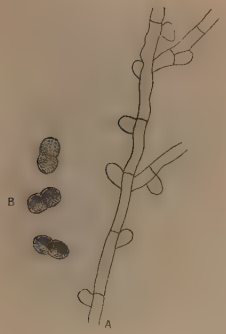
EXPLANATION OF PLATES XIII—XIX.

[All drawings were made with the camera lucida, and with the same magnification (Zeiss obj. D, No. 5 ocular).]

FIG.

1. *Englerulaster Popowiae* Doidge, n. sp. (*a*) Mycelium showing hyphopodia; (*b*) spores.
2. *Englerulaster orbicularis* (B. & C.) v. Höhn. (*a*) Mycelium showing hyphopodia and incipient thyriothecium; (*b*) immature and (*c*) mature spores; (*d*) conidia.
3. *Parasterina implicata* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
4. *Parasterina brachystoma* (Rehm.) Th. (*a*) Mycelium; (*b*) spores.
5. *Parasterina rigida* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
6. *Asterina gibbosa* Gaill. var. *megathyria*, n. var. (*a*) Mycelium with "node cells"; (*b*) ascus; (*c*) spores.

7. *Asterina natalensis* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
8. *Asterina Combreti* Syd. (*a*) Mycelium and pycnidium; (*b*) immature and (*c*) mature spores; (*d*) conidia.
9. *Asterina Peglerae* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
10. *Asterina tenuis* Wint. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
11. *Asterina fimbriata* Kalch. & Cke. (*a*) Mycelium; (*b*) spores.
12. *Asterina reticulata* Kalch. & Cke. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
13. *Asterina uncinata* Doidge, n. sp. (*a*) Mycelium showing two- and three-celled hyphopodia; (*b*) spores.
14. *Asterina delicata* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
15. *Asterina Grewiae* Cke. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
16. *Asterina Trichiliae* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
17. *Asterina raripoda* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
18. *Asterina ferruginosa* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
19. *Asterina rhamnicola* Doidge, n. sp. (*a*) Mycelium; (*b*) spores.
20. *Asterina Hendersoni* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
21. *Asterina opaca* Syd. (*a*) Mycelium; (*b*) spores.
22. *Asterina robusta* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
23. *Asterina erysiphoides* Kalch. & Cke. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
24. *Asterina Balansae* (Speg.) Th., var. *africana* Sacc. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
25. *Asterina Excoecariae* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
26. *Asterina undulata* Doidge, n. sp. (*a*) Mycelium, showing hyphopodia and two incipient thyriothecia; (*b*) mature and (*c*) immature spores.
27. *Asterina polythyria* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
28. *Asterina peraffinis* Speg. (*a*) Mycelium; (*b*) spores.
29. *Asterina celtidicola* P. Henn., var. *microspora* var. nov. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
30. *Asterina ? vagans* Speg. (*a*) Mycelium; (*b*) spores.
31. *Asterina sphaerasca* Thüm. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
32. *Asterina loranthicola* Syd. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
33. *Asterina clausenicola* Doidge, n. sp. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
34. *Asterina diplocarpa* Cke. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
35. *Asterina tertia* Rac., var. *africana* n. var. (*a*) Mycelium; (*b*) spores; (*c*) conidia.
36. *Asterinella Acokantherae* Doidge, n. sp.
37. *Asterinella Burchelliae* Doidge, n. sp.
38. *Asterinella Woodiana* Doidge, n. sp.
39. *Asterinella lembosioides* Doidge, n. sp. The finer mycelium of the *Asterinella* can be seen investing the stouter hyphae of *Balladyna velutina*.
40. *Microthyrium maculicolum* Doidge, n. sp.
41. *Morenoina africana* Doidge, n. sp. Shows the elongated thyriothecia and the orbicular pycnidia.
42. *Amazonia asterinoides* Th.
43. *Echidnodes rhoina* Doidge, n. sp.
44. *Lembosia natalensis* Doidge, n. sp. Showing elongated thyriothecia and a round pycnidium.
45. *Lembosia congesta* Wint.; from the leaf of *Carissa* sp. On the stem the mycelium is not so well developed, and the hyphae are inclined to run parallel, following the striations in the bark.
46. *Lembosia radiata* Doidge, n. sp. Showing the orientation of the thyriothecia.



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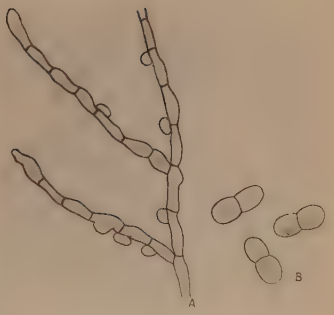

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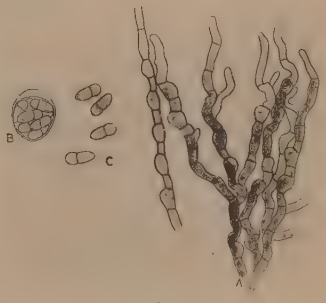

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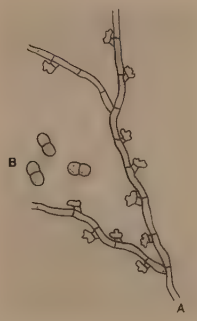

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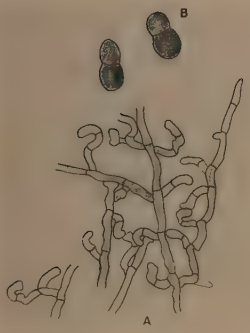

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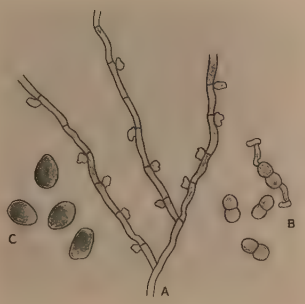

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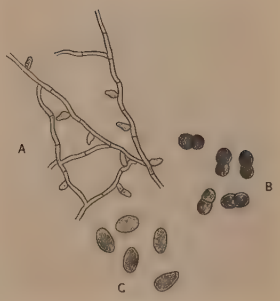

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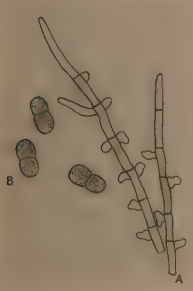

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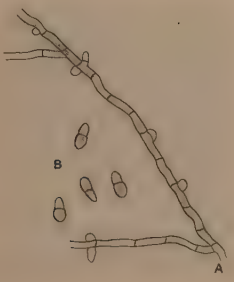

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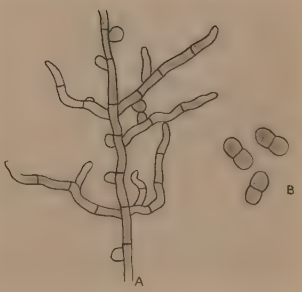

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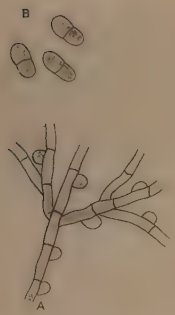

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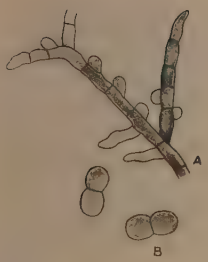

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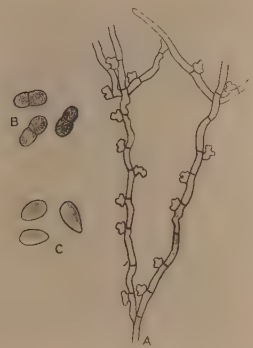

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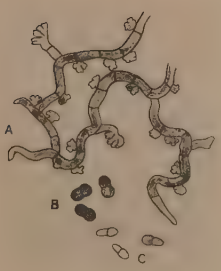

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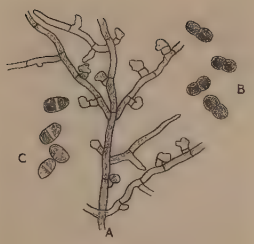

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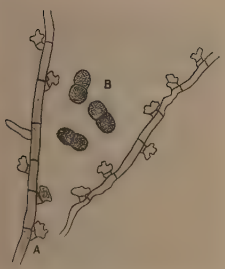

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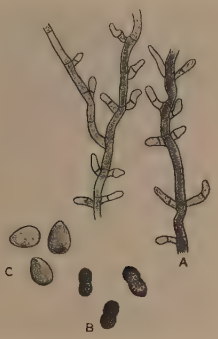

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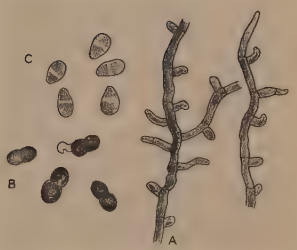

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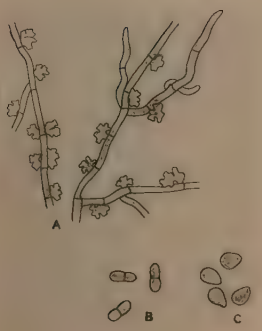

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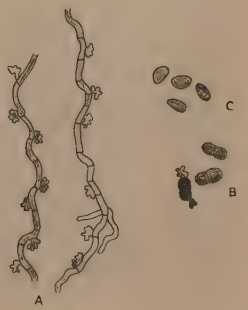

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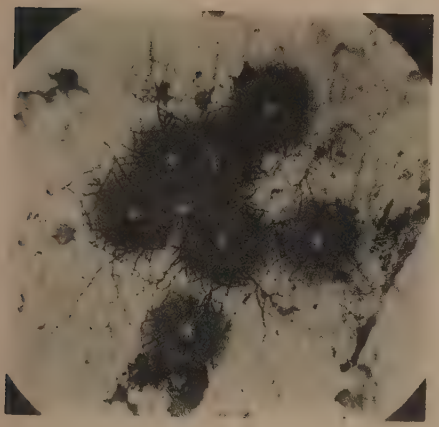

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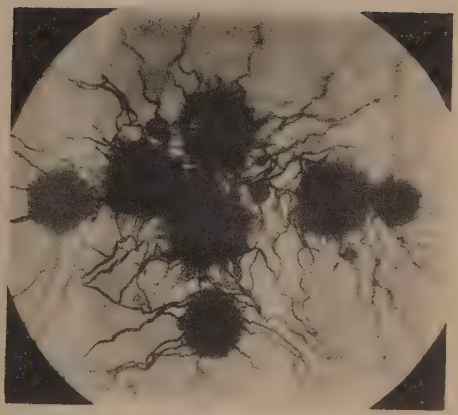

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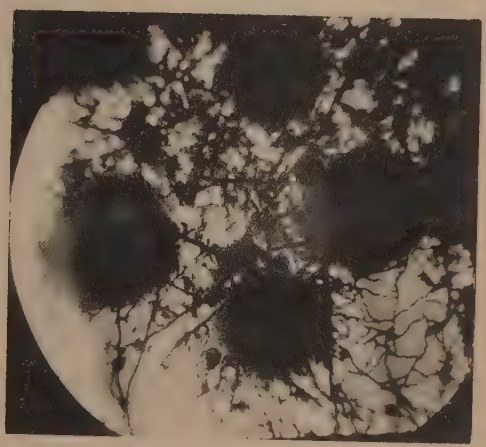

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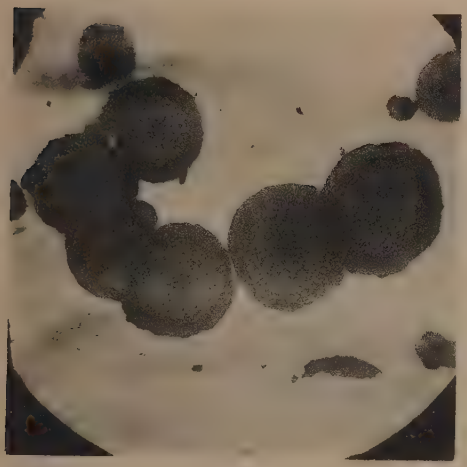

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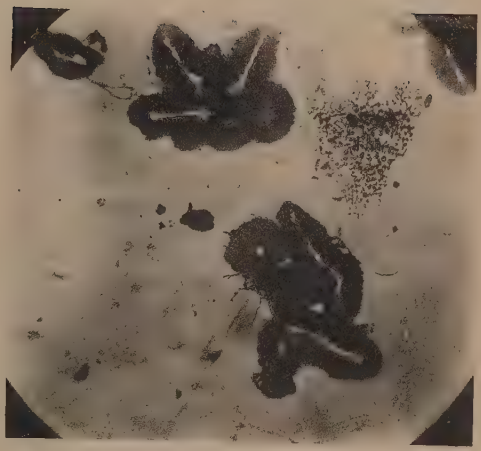

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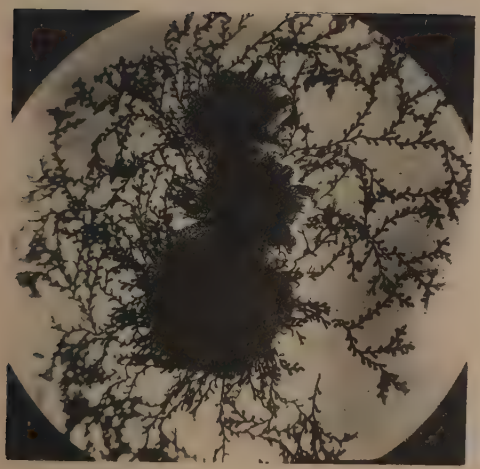

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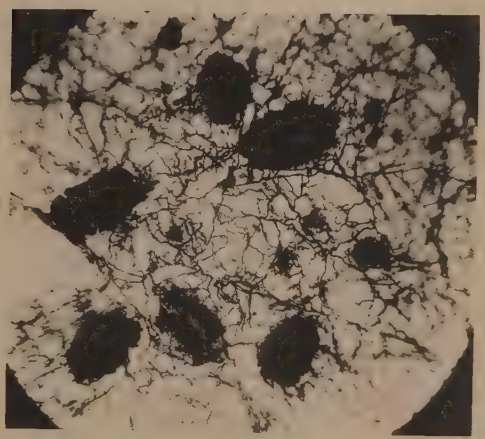

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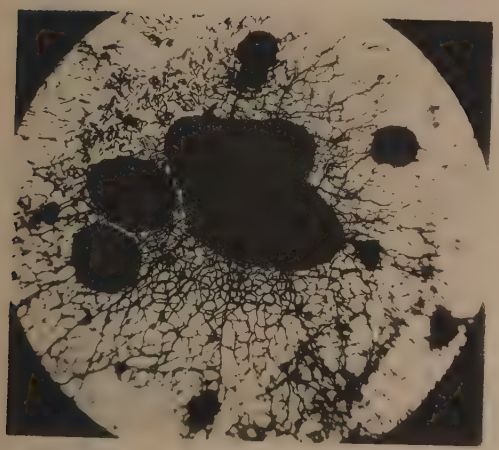

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